CHAPTER 9

ROCHESTER, MINNESOTA

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9.1 INTRODUCTION

On February 20, 1998, the Dakota, Minnesota, and Eastern Railroad (DM&E) filed an Application with the Surface Transportation Board (Board) to construct and operate approximately 281.0 miles of new rail line into the Powder River Basin (PRB) in eastern Wyoming, and reconstruct approximately 598.0 miles of its existing rail line through Minnesota and South Dakota. DM&E said its primary goals were access the coal mines in Wyoming's PRB, increase rail competition in the PRB, and generate additional revenue for rehabilitation of existing rail line to provide better and safer service to its existing customers.

During the project's scoping process, the City of Rochester, Minnesota proposed to the Board's Section of Environmental Analysis (SEA) a route that would bypass the City to mitigate the project's potential impacts on the community. In a report dated January 6, 1999, the City of Rochester presented five alternatives to minimize the impact of reconstruction of the existing rail line and coal transport through Rochester. As alternatives to DM&E's proposed reconstruction of existing rail line, Rochester proposed (1) a railroad tunnel beneath the city, (2) a railroad trench through Rochester, (3) a 28.8-mile bypass north of Rochester, (4) a 34.1-mile bypass south of Rochester, and (5) a 45.5-mile bypass south of the City. Rochester examined each alternative for potential environmental impacts and concluded that the 34.1-mile south bypass (known as Route R-4) would be the preferred alternative (Figure 9-1). The City's submission contained sufficient information for SEA to make a preliminary determination that the proposed bypass appeared to be a feasible alternative. Therefore, the south bypass route was included in the Final Scope for the project, issued on March 10, 1999, and SEA invited public comment on it until April 10, 1999.

On June 10, 1999, Rochester submitted a second proposed alignment similar to the original, with two exceptions. The first is a deviation from where the proposed route follows the east/west section center line in T105N, R15W, Sections 15 and 14 to avoid a residence otherwise within the right-of-way (Figure 9-2). The second is a similar deviation from where the proposed route follows the north/south section center line in T106N, R15W Sections 31, and 30 to avoid a large wetland area (Figure 9-2). SEA reviewed this proposed route. But because it was submitted after the April 10, 1999 close of public comment period for the Final Scope and was untimely, SEA did not subject it to the same stringent analysis as the original Rochester bypass (Route R-4).

SEA recognizes that the revised Rochester bypass would reduce potential environmental impacts to some resources. However, it would not overcome the essential flaws in the proposed R-4 route, which are discussed below.

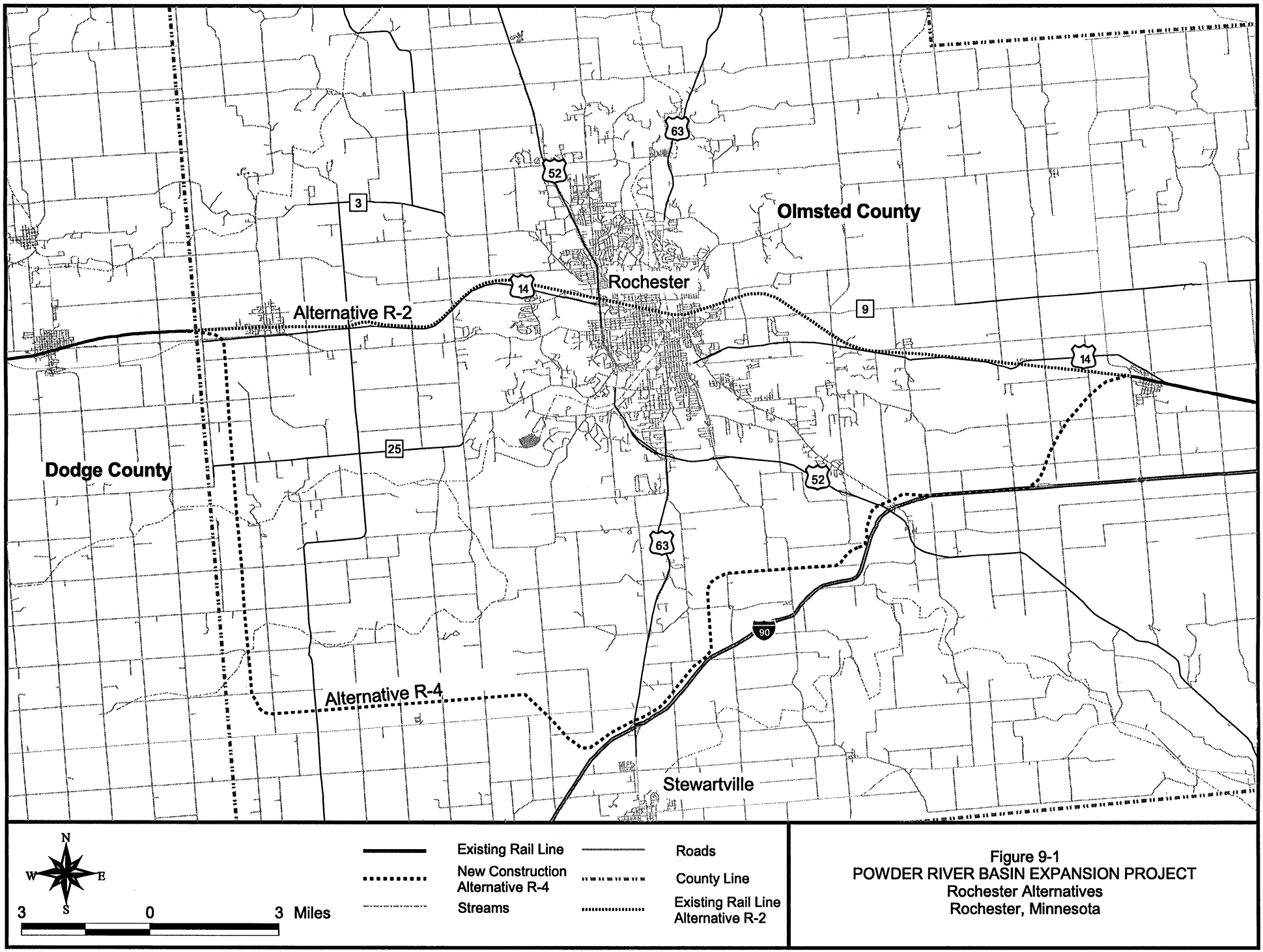

Figure 9-1
POWDER RIVER BASIN EXPANSION PROJECT
Rochester Alternatives
Rochester, Minnesota

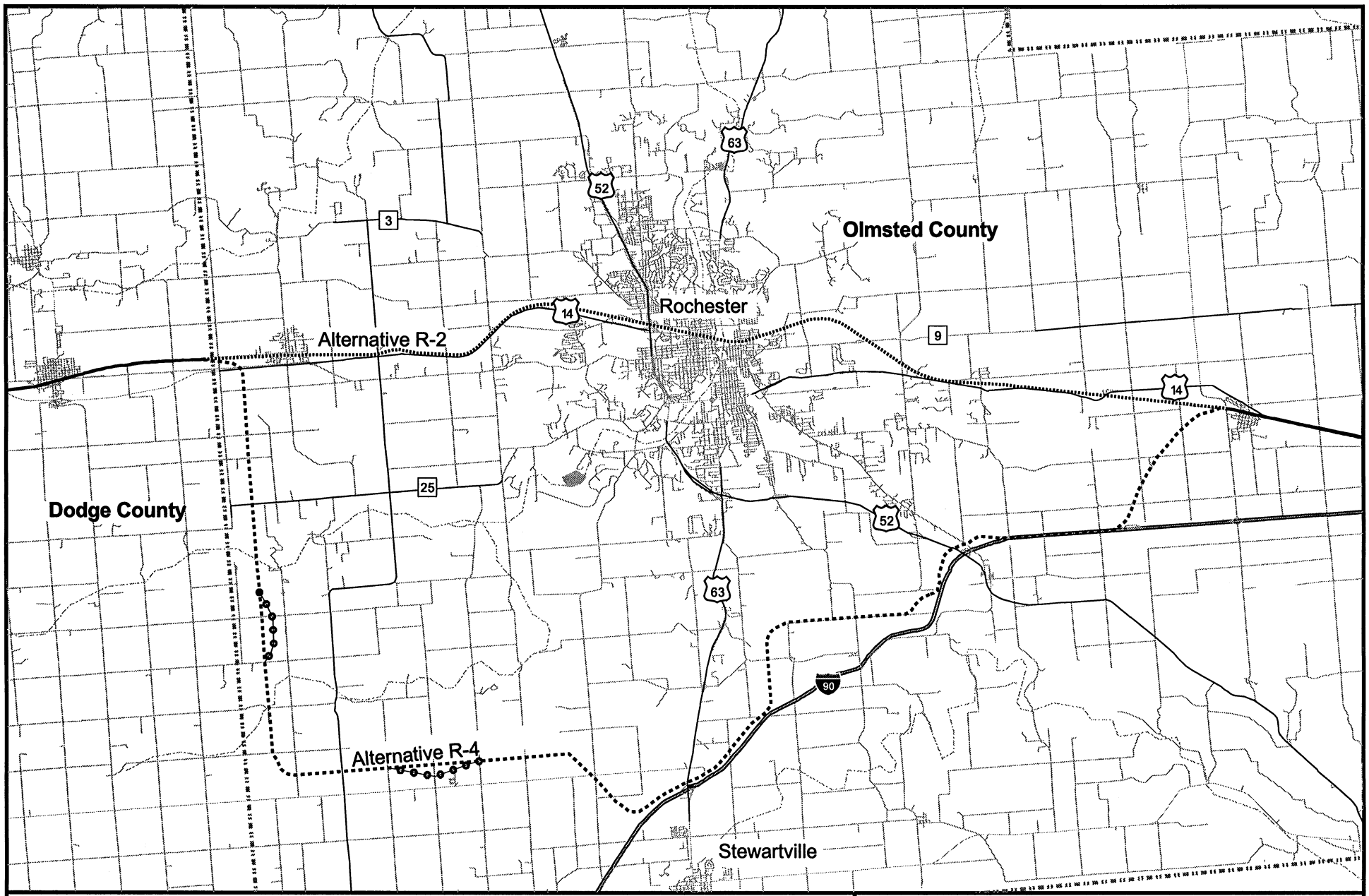

Figure 9-2
POWDER RIVER BASIN EXPANSION PROJECT
Revised Rochester Bypass Alignment
Rochester, Minnesota

9.1.1 THE BOARD'S JURISDICTION TO REQUIRE CITY BYPASSES

Some commenters questioned the Board's authority to require DM&E to construct bypasses around cities as mandatory mitigation conditions on its approval of DM&E's project. They believed that the Board could not place conditions upon activities connected to the proposed rebuild, and only had jurisdiction over new construction. Even if the Board had this authority, they argued, it would contravene existing laws by requiring DM&E to file additional applications with the Board, since bypasses would be new construction cases, requiring separate Board approval before implementation. These commenters stated that placing bypass conditions on current construction makes little sense, because the Board would have to evaluate each bypass proposal independently as new construction. Also, they believe that Interstate Commerce Commission Termination Act of 1995 (ICCTA) prevents the Board from directing the amount and type of traffic DM&E can move over its rail lines, so that even if bypasses were built, the Board could not force DM&E to utilize them.

As the Draft EIS and Final EIS explain, the environmental review conducted for DM&E's proposal addresses the existing line, as well as the Extension Alternatives, because the increase in operations over the existing line would not occur but for the new construction project. However, the cooperating agencies need information on the existing line to undertake their decision-making processes.

SEA has properly considered the bypasses as part of its environmental review in this case. NEPA requires the Board to take a hard look at the environmental consequences of its decisions, and the responsibility to consider reasonable and feasible alternatives to a proposed transaction is at the heart of the National Environmental Policy Act (NEPA) analysis.[1] Reasonable and feasible alternatives to a construction proposal are defined as alternatives that would satisfy the railroad's objectives but might be environmentally preferable to the route that the railroad originally proposed. Such an alternative could include a bypass.

Congress also gave the Board broad authority to modify rail construction proposals and impose conditions on the Board's approval of a proposal.[2] It is well settled that the Board can impose conditions, including conditions designed to mitigate environmental impacts, so long as they are supported by the record, and there is a sufficient nexus between the condition imposed

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[1] Citizens Against Burlington, Inc. v. Busey, 938 F.2d 190, 194 (D.C. Cir), cert.denied, 502 U.S. 994 (1991); 42 USC 4332(2)(E).

[2] 49 U.S.C. 10901(c).

and the transaction before the Board.[3] In rail construction cases, the Board typically has used its power to impose conditions such as grade crossing protection, erosion control, re-seeding and revegetation of disturbed areas, and advanced notification of train schedules to emergency service providers. But additional types of mitigation–including ordering a bypass–could be found to be reasonable if necessary to remedy a severe problem resulting from the proposal itself.

In short, SEA believes that the Board has the authority to require a bypass, where reasonable, as an environmental mitigation condition or as an environmentally preferable alternative. Should the Board do so, its order imposing a bypass condition on its approval of a construction proposal would constitute Board authorization for the bypass. Whether some additional public notice and opportunity for comment would be needed in such a situation would depend upon whether the public review and comment obtained through the environmental review process had sufficiently addressed the bypass.

9.1.2 ROCHESTER ALTERNATIVES ANALYZED

In the Draft EIS four alternatives were analyzed for Rochester including:

- Alternative R-1: No Action Alternative,
- Alternative R-2: Reconstruction of the existing rail line as proposed by DM&E,
- Alternative R-3: Approval of bypass for coal traffic only, and
- Alternative R-4: Approval of bypass for all rail traffic (as proposed by the City of Rochester).

After completing the detailed analysis of the Rochester alternatives in the Draft EIS and reviewing public comments, SEA determined that differences in the impacts of Alternatives R-3 and R-4 would be minimal,[4] and that additional analysis for the Rochester alternatives was appropriate. However, additional analysis in the Final EIS was limited to Alternatives R-2 and R-4 because:

- Alternative R-1 (No-Action) depends on the Board's ultimate approval of the project,

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[3] See United States v. Chesapeake & Ohio Ry., 426 U.S. 500, 514-15 (1976); Consolidated Rail Corp. v. ICC, 29 F.3d 706, 714 (D.C. Cir. 1994).

[4] The difference between Alternatives R-3 and R-4 would only occur during operation of the rail bypass, with Alternative R-4 operating three more trains per day. Rail traffic of three trains per day is below the Board's threshold of eight trains per day for detailed analysis of many operational impacts, such as air quality, noise, transportation, and safety.

- Alternative R-2 is identified as the Applicant's preferred alternative,
- There are minimal differences between Alternatives R-3 and R-4, and
- Alternative R-4 is identified as Rochester's preferred alternative.

As part of its additional analysis, SEA made more site visits and studies along the Alternatives R-2 and R-4 project areas, and extensively reviewed existing information related to comments on potential impacts of these alternatives. The natural and human resources for which SEA conducted additional analysis are presented in this chapter. Where there were comments on a particular issue in the Draft EIS but SEA determined that the level of analysis is appropriate to the potential impact on a resource, a summary of both the comments received and the information presented in the Draft EIS is included here.

This chapter contains a description of Alternatives R-2 and R-4, with an overview of existing conditions along each alternative previously described in the Draft EIS along with the potential impacts to these resources. Potential mitigation measures the Board could impose as part of any project approval are also included. Finally, this chapter contains a discussion of SEA's rationale for the selection of a preferred alternative for Rochester.

9.2 DESCRIPTION OF ALTERNATIVES R-2 AND R-4

The following briefly describes Alternatives R-2 and R-4. See Chapters 2 and 3 of the Draft EIS for more detail on Alternatives R-2 and R-4, as well as Rochester Alternatives R-1 and R-3.

Alternative R-2: Reconstruction of Existing Rail Line

Alternative R-2 would involve rehabilitation of DM&E's existing rail line through Rochester, to make it suitable for movement of unit coal trains. Approximately 23.3 miles of existing rail line through Byron, Rochester, Chester, and unincorporated portions of Olmsted County would be rehabilitated. Following rail line rehabilitation, about three freight trains per day and up to 34 unit coal trains per day (17 loaded, 17 empty) would pass through Rochester.[5]

[5] DM&E has said that it anticipates interchanging its coal trains at points west of Rochester; therefore, substantially fewer than 34 unit coal trains may move through Rochester. However, without signed coal contracts, DM&E cannot state with certainty how much of its coal traffic would move off its rail line. Because total traffic counts through Rochester and the rest of DM&E's existing system are uncertain, SEA calculated unit coal traffic on a "tiered" basis, studying the effects at 20, 50, and 100 million tons of coal moved annually. The maximum number of trains anticipated by DM&E in its application is 34 unit coal trains each day.

Alternative R-4: Bypass for All Rail Traffic

Under Alternative R-4, DM&E would construct and operate approximately 34.1 miles of new rail line through Olmsted County, Minnesota to eliminate the need to operate through-trains over its existing rail line through Rochester. All existing rail traffic, as well as future unit coal trains would use this bypass. Only trains serving current shippers along the existing rail line in Rochester would continue to operate over the existing rail line.

Alternative R-4 would run from the existing DM&E rail line just west of Byron, turning south along the Olmsted/Dodge County line (Figure 9-1), and cross Salem Creek to State Highway 30. There it would turn eastward, generally paralleling the north side of Highway 30 to Interstate 90, then turn northward to follow the northwest side of the interstate before connecting to the existing line just west of Eyota.

Although this alternative involves conversion of present land use to rail line right-of-way and operation of the rail line along the bypass route, DM&E's existing rail line in Rochester would also remain operational to serve current rail shippers along that line. Minimal rail traffic, about one train per day in each direction, would likely continue to operate over the existing line. Since this is less traffic than currently travels through Rochester, impacts associated with rail operation would be decreased due to fewer trains. Because through-train traffic would be less than the Board's threshold of eight trains per day and impacts associated with DM&E's current traffic are pre-existing conditions and not project-related, SEA has generally not included impacts associated with train movements within Rochester in its consideration of the impacts of operation of the proposed bypass.

9.3 COMPARISON OF IMPACTS

The following sections present a summary of potential impacts of each Rochester alternative, based on the discussion in the Draft EIS, comments on SEA's analysis, and the results of SEA's additional analysis conducted in response to those comments.

9.3.1 TOPOGRAPHY

Topography describes land contours and elevations, "the lay of the land." The topography in the Rochester area can be described as gently rolling glacial terrain with many depressions and steep slopes near major rivers. Changes in topography, such as stream channelization and excavation of surface material to cut through hills, can create changes in surface water drainage patterns, resulting in drainage into rail cuts instead of into existing streams, or increases in-stream flow velocities causing stream bank erosion and altering in-stream sedimentation patterns.

Alternative R-2: Reconstruction of Existing Rail Line

As discussed in Chapter 3 of the Draft EIS, minor changes in topography along the existing rail line resulted from construction of the existing rail line through Rochester more than 100 years ago. Because that area was and remains relatively flat, only minor cuts and fill were necessary to construct the original rail bed. Should rail bed work be necessary to reconstruct the existing line, only minimal alteration of the topography would be required. Therefore, reconstruction of the existing rail line would have no significant impact on the topography of the Alternative R-2 project area.

Alternative R-4: Bypass for All Rail Traffic

Although Chapter 3 of the Draft EIS noted that Alternative R-4 would result in local topography changes, Citizens Against the Rochester Bypass (CARB) commented that the extent of these changes was not clear in the Draft EIS. SEA's analysis of potential topographical changes for construction of Alternative R-4 was amplified to clarify the anticipated impacts.

SEA's additional analysis indicates that the undulating terrain along the alignment of Alternative R-4 would require a series of alternating deep cuts and high fills (30 to 50 feet) to maintain a grade of one percent or less. SEA's detailed calculation of the cuts and fills that would be required to construct Alternative R-4 determined that in the western portion of Alternative R-4, particularly the Salem Creek area, fills of 90 feet or more could be required to cross creeks and drainages. These fill sections would hinder the flow of surface water where the line would cross Bear Creek, Badger Run, Willow Creek, South Zumbro River (about 3,000 feet of fill, 30 feet high), and Cascade Creek. New rail line drainage structures would be needed to collect surface water and route it to culverts or bridges to direct it under the rail line, probably changing the flow dynamics of streams crossed. Similarly, cut sections would intercept surface water flow, drain it into the rail cut, and require routing it to nearby streams to direct it under the rail line. SEA also determined that extensive cuts would be required in the eastern portion of Alternative R-4, particularly near the intersection of I-90 and Highway 52, extending up to 2,500 feet and 30-40 feet or more deep.

A 3:1 slope (3 feet up per horizontal foot) for cut slope stability would require excavation of about 5.3 million cubic yards of material. A 3:1, 2:1, or combination of the two could be used for fill areas, requiring between 13.0 million cubic yards (3:1) and 7.2 million cubic yards (2:1) of fill. This would create a cut-fill imbalance of from 4 to 8 million cubic yards of additional fill. Cut and fill could be more closely matched by flattening cut slopes from 3:1 to 4:1 to generate more fill but this would increase land-disturbance and environmental impacts. Using 3:1 cut slopes and

2:1 fills as practicable would still require about 2 million cubic yards of fill from another location.[6] Because most fill would be on the western side, and most cut material on the eastern side, fill might have to be hauled more than 10 miles one way. This would increase material handling and equipment, fuel, hauling time, and the number of heavy trucks on rural roadways, resulting in excessive wear and tear to roadways, bridges, and culverts. Operation of Alternative R-4 would have no further impact on the topography.

Topography changes could be minimized during construction by raising the rail line on trestles rather than on earthen fill, particularly at crossings such as Salem Creek. However, while reducing the need for fill material, trestles would increase project construction and maintenance costs. They would likely result in cut material along the rail line exceeding the need for fill, requiring cut material to be hauled off for use elsewhere, or disposed of locally in soil piles. Overall, construction of Alternative R-4 would cause substantial changes to local topography.

9.3.2 GEOLOGICAL HAZARDS

Geological hazards are conditions within or characteristics of soil and bedrock that result in risks that structures or facilities placed above them could be damaged, or that could result in risks to human health and the environment as a consequence of building over them. Some examples are fault lines, unstable slopes, and sinkholes.[7] The Draft EIS indicated that parts of the Alternative R-4 route have known karst conditions where sinkholes may form. Sinkholes present a risk during rail line construction and operation because heavy construction equipment and coal trains may cause the collapse of underground caverns. In addition, there is a significant risk that new sinkholes can form in the future, not due to either construction or operation of trains, but potentially resulting in catastrophic derailment. In areas of karst topography, extensive and expensive measures are necessary during construction to attempt to reduce risks to allow safe rail operations, but even with these measures, SEA preliminarily concluded in the Draft EIS that additional sinkholes could form if the Rochester bypass (Alternative R-4) is approved and

[6] Rochester estimated that Alternative R-4 would require 4.2 million cubic yards of cut and 3.3 million cubic yards of fill. With 0.9 million cubic yards of excess cut material, spoil areas for its disposal would be needed. SEA's analysis found fill requirements substantially exceeding cut material, the opposite of Rochester's result. See Appendix M.

[7] Sinkholes are locations where the top of a subsurface void, or opening (formed through the dissolution of carbonate-type rock), has partially collapsed, creating an opening from the surface down to the void. Sinkholes can very in size from a few feet to many feet and the voids under them may be only a few cubic yard or hundreds to thousands of cubic yards in size. The size of the sinkhole, however, is not an indication of the size of the void. Small sinkholes may lead to extensive voids, larger sinkholes many involve complete collapse of the top of the void.

constructed, posing a significant safety risk. SEA noted that the combination of shallow groundwater and karst topography make groundwater contamination through sinkholes in the event of a derailment or spill more likely along Alternative R-4 than along R-2.

SEA received many comments addressing karst topography in the area surrounding Rochester. The City of Rochester indicated that construction problems in karst topography under Alternative R-4 could be overcome through generally accepted, though comprehensive and expensive, engineering practices.[8] Rochester also noted that karst conditions also occur along the existing rail line, asserting that the potential for impacts is similar to what SEA described for Alternative R-4. CARB's comments supported SEA's position that karst topography in the area poses significant safety concerns for rail line construction and operation along the bypass route.

In light of the comments received, SEA made additional site visits and researched Rochester-area geology. Presented below are the results of SEA's additional analysis for each alternative, including discussion of the general geology of the Rochester and Olmsted County area as it relates to Alternatives R-2 and R-4, and potential impacts from their construction (or reconstruction) and operation due to these hazards. Additional technical details can be found in Appendix M.

Both Rochester alternatives are within Olmsted County, Minnesota. The near-surface geology of Olmsted County includes two principal geologic units, Cenozoic age unconsolidated overburden of primarily glacial drift, and Paleozoic age bedrock strata chiefly of limestone, shale, and sandstone. Usable quantities of groundwater typically occur in the more highly permeable layers. Unconsolidated overburden soils occurring in much of Olmsted County comprise primarily glacial deposits of both till and outwash, with some wind-deposited silts (loess). The overburden is highly variable in lithology, ranging from clays and silts to sands and gravels.

Since most of southeastern Minnesota missed the latest glacial event and parts of the area around Olmsted County is considered driftless, glacial deposits are relatively thin, ranging from zero to approximately 50 feet thick above bedrock. West of Rochester the drift thickens to as

[8] Rochester's comments on the Draft EIS (at Exhibit 22) specify the detailed steps a railroad would have to take to build a rail line in areas of high karst potential. First would be the identification of subsurface conditions. Rochester states that the railroad then would have to design engineering approaches to correct or mitigate karst features, including controlling the flow of water. For example, all ditches and areas where water collects must be lined and the collected water discharged at a remote location. Potential sinkholes also would have to be filled to stabilize the terrain, including excavating bedrock, filling rock cavities with concrete, and backfilling depressions. Special construction techniques would have to be used including the installation of appropriate drainage facilities. Finally, special steps must be taken to maintain and monitor facilities built on karst, such as frequent observation of treated sinkhole areas.

much as 250 feet. Locally, where the drift comprises primarily fine-grained materials in its aquitard (confining layer) or, where it consists of sands and gravels, it locally comprises an aquifer. The thicker the drift, the more probable that it is acting as a confining layer, due to the predominance of fine grained materials within it. Because the area around Rochester has very little glacial drift, bedrock exposures are common along streams and rivers. Recently deposited river alluvium of silt, sand, and gravel locally makes up the uppermost unconsolidated overburden of valley floors.

The upper bedrock units, down to depths of about 1,000 feet, are comprised of marine sedimentary rocks of early Paleozoic age. From the youngest to the oldest, the principal shallow bedrock strata within the county include:

- Maquoketa Shale and Dubuque Formation - Occurring in a small area of the county's southwestern corner, only about 20 feet of the lower member's lower beds are present.
- Galena Group - Subdivided into three main units, from the top down: the Stewartville Formation, widely exposed Prosser Limestone, and the Cummingsville Formation. The group comprises an aquifer.
- Decorah Shale.
- Platteville Formation, primarily limestone.
- Glenwood Formation, a sandy shale.
- St. Peter Sandstone - Sandstone, well sorted and poorly cemented, major aquifer.
- Prairie du Chien - Shakopee (thin to medium-bedded dolomite) and Oneota (thick-bedded to structureless dolomite).
- Jordan Sandstone - Not exposed in Olmsted County, occurring only within subsurface, over a confining siltstone unit up to 75 feet thick called the St. Lawrence. The Jordan comprises a major aquifer.

The bedrock geologic map of the county (Olsen, 1988) shows the distribution of these strata, where they outcrop or subcrop beneath the unconsolidated overburden. The youngest of the strata are typically beneath upland portions of the county but have been eroded from major valleys and lowlands. Thus, the Maquoketa and Dubuque occur in the county's southwest, but were eroded away further north, where the uppermost bedrock is the Galena. Within major stream valleys, the Galena has also been eroded away, exposing (in succession) the Decorah, and below that the Glenwood, St. Peter, Platteville, and Prairie du Chien where erosion has cut deep valleys.

Alexander and Maki (1988) mapped sinkholes in Olmsted County and developed a probability rating for sinkhole development throughout the county. Their criteria for mapping the different levels of probability for sinkholes to form are:

- **No Probability** - Areas where no carbonate rock exists due to erosion in deep valleys.

- **Low Probability** - Areas where no sinkholes were observed and there was more than 50 feet of cover over the bedrock and in areas of steep slopes and bluffs.

- **Low to Moderate Probability** - Bedrock surface with thin layer of drift. Average sinkhole density less than one per square mile (low) with few sinkhole clusters (moderate).

- **Moderate to High Probability** - Average sinkhole density one to five sinkholes per square mile with sinkholes in clusters of three or more. Overburden soils underlain by carbonate bedrock units, which are a significant engineering concern, especially for large facilities.

- **High Probability** - Average sinkhole density is 5 to 20 per square mile with sinkholes common. Soils underlain by carbonate bedrock units. Highly sensitive to groundwater fluctuation, weight of surface structures, or changes in hydraulic conditions. Highlands near steep sloped valleys are highly susceptible due to increased hydraulic gradient.

- **Karst Topography** - Sinkhole density is 20 to hundreds per square mile and a dominant feature. All precipitation infiltrates or flows into karst features, which is a major concern for construction in the area. Such high density of sinkholes occurs exclusively in areas underlain by the Galena Group.

Areas of Olmsted County having moderate to high probability and karst topography, and the greatest identified risk of sinkhole collapse, are restricted primarily to locations where the Stewartville and the upper portion of the Prosser limestone strata are the uppermost bedrock and the soil is relatively thin. The existing rail line, Alternative R-2, is entirely within areas classified as low to moderate probability for sinkhole formation. While Alternative R-4 also crosses significant stretches of low to moderate probability, it transects two major areas having both moderate to high probability of sinkhole formation and one area of karst terrain.

One mechanism for the formation of sinkholes is the collapse of a bedrock cave in the carbonate bedrock. A second, more serious problem than the simple collapse of a hidden cave is posed by voids in the overburden soil formed by groundwater moving through caves or solution enlarged joints in the bedrock, undermining the soil overburden. In places, the soil overburden collapses into the bedrock cave or joints, forming a dome-shaped cavity in the soil. Where the soil has already collapsed to form a sinkhole at the ground surface, the seriousness of this problem is much reduced, and the cratered terrain can be remediated with engineering measures, such as backfilling with crushed rock. But the greatest risk is that, given the right conditions, the soil may bridge over the bedrock voids, resulting in hidden and relatively unpredictable hazards. It is where the voids have not yet collapsed that the enormous risks of catastrophic failure exist.

No subsurface testing of the rural area surrounding Alternative R-4 to identify sinkholes or uncollapsed subsurface voids has been conducted. However, because Alternative R-4 already includes areas classified as high probability and karst, and because the geology along all of Alternative R-4 is similar, it is likely that significant numbers of sinkholes could be present but hidden from view along the alignment.

In general, the probability of encountering a hidden subsurface void that can collapse to form a sinkhole is based on what can readily be observed at the surface. Thus, areas with the most observed sinkholes are properly classified as areas most likely to have sinkhole formation in the future. But in undeveloped areas with deeper soils, sinkholes may not be apparent at the surface. Therefore, even areas classified as having a low probability of sinkhole formation may actually contain large numbers of hidden sinkholes. If substantial additional structural load, such as a new rail line transporting unit coal trains, is added to such areas, significant numbers of previously hidden sinkholes could open. Moreover, the time frame for collapse of such sinkholes cannot be accurately predicted; it may occur today, or twenty years from today.

Geological Hazard Impacts on Alternative R-2: Reconstruction of Existing Rail Line

Based on the Map of Surficial Geology (Hobbs, 1988) much of the eastern half of the existing rail line, Alternative R-2, transects areas of shallow bedrock (less than five feet of overburden) and ground where the glacial till overburden is slightly greater (over five feet). The bedrock is primarily non-carbonate rock, including the St. Peter sandstone and Decorah shale. Dolomites of the Prairie du Chien group are also found locally in this area. In the central part of the existing rail line, primarily in the City of Rochester, the surficial soils are predominantly terrace deposits and alluvium. In this central area, a broad belt of carbonate bedrock strata comprises the upper carbonate aquifer, the bedrock sequence where most of the county's karst conditions are located. Sinkholes have been observed in the vicinity of the existing rail line, particularly to the south of the line. To the west, the line cuts through two symmetrical belts of

Decorah shale and St. Peter sandstone as it drops into and rises out of the valley where Rochester lies on a broad belt of Prairie du Chien dolomite. Bedrock beneath the uplands on the western end of the existing rail line is comprised of upper carbonate aquifer rocks. For a stretch of the existing rail line, several thousand feet long at the western end, the soil generally is loess or till over five feet thick.

According to Minnesota Geological Survey[9] data, the route of Alternative R-2 — use of DM&E's existing route — passes through a region of low to moderate probability for sinkholes — an average density of one per square mile. Alternative R-2 crosses strata that are not highly susceptible to karst formation, evidenced by the relative lack of sinkholes along the route. Moreover, the risk of hidden voids within the soil overburden along the existing route is low, based on two facts: surveys identify only four sinkholes near or within the existing DM&E right-of-way, and second, the existing route has been in operation for over a century.[10] If subsurface voids had developed along or under the existing rail line, they likely would already have been collapsed by the loading and vibration from years of existing railroad operations. This indicates that hidden sinkholes likely are not present and that sinkholes pose no threat to the proposed reconstruction and operation of the existing line.

Geological Hazard Impacts on Alternative R-4: Bypass for All Rail Traffic

Alternative R-4 crosses a different series of bedrock strata than Alternative R-2 for most of its length. The alignment crosses three areas with different types of surface soil. Approximately the eastern third of the alignment crosses an area with an overburden typically five feet or less thick, with known sinkholes concentrated in a portion of this segment. The central third crosses an area of loess and glacial till of five or more feet thick above bedrock, with some known sinkholes. Except for areas where this route crosses narrow stream valleys with exposed Decorah shale, the entire alignment crosses areas where the bedrock contains upper carbonate aquifer formations, the geology in the county where sinkholes are most likely to develop. The western third of the alternative alignment crosses areas with approximately five feet of glacial till over the bedrock. Only scattered sinkholes have been noted in this area.

[9] E. Calvin Alexander, Jr., and Geri L. Maki, *Geologic Atlas of Olmsted County, Minnesota.* (University of Minnesota, Minnesota Geological Survey, 1988).

[10] As CARB states in its comments, in the past the existing line through Rochester has seen the passage of many thousand trains, including long freight trains and heavy steam locomotives with loads similar to coal trains.

In analyzing Alternative R-4 for this Final EIS, SEA observed sinkholes with significant open voids beneath them, supporting the conclusion that sinkhole formation is ongoing even though the area is still undeveloped. During SEA's site visits, landowners told SEA that the sinkholes on their property were relatively recent. SEA verified that the sinkholes likely were formed relatively recently by observing that the soil around the sinkholes showed signs of recent disturbance because of the condition of the soil and the lack of ground cover and vegetation. In SEA's view, construction and operation of a railroad for coal transport along this route, where the presence of hidden subsurface voids, that would lead to formation of sinkholes is likely,[11] would entail a significant risk.[12]

As Rochester itself acknowledges, extensive steps would be required to construct and operate a rail line for unit coal trains over Alternative R-4. As previously noted, at a minimum, there would have to be engineering measures to mitigate the risk of sinkhole formation along the route, a detailed geophysical (seismic) investigation of the route passing through the high probability and karst areas, and a drilling and sampling program to confirm geophysical results. Additionally, dynamic compaction of soils along the route to intentionally collapse voids before construction as well as careful monitoring for subsidence in the future for the life of the project, would be needed.

Rochester estimates that the total cost of constructing the R-4 bypass would be nearly $92 million, including $800,000 for "Karst Investigation," which it defines as investigation of the karst and sinkhole potential.[13] But at this time there is no way even to estimate the potential cost for

[11] As previously stated, Alternative R-4 already includes areas classified as high probability and karst, and the geology along all of Alternative R-4 is similar.

[12] SEA has learned that unstable geologic formations could have played a role in other recent railroad accidents, including an Amtrak derailment, which occurred following a flash flood that washed out a BNSF bridge. Specifically, BNSF representatives have indicated to SEA that their investigations into the accident led BNSF to conclude that a new bridge that had been built downstream from BNSF's existing bridge was constructed through a layer of hard mineral soil, called caliche. BNSF stated that when the caliche was removed, years of exposure to flowing water during rains eroded away softer soil located upstream from the new bridge. This erosion subsequently resulted in a "head-cut" – a phenomenon involving the force of water flowing downward like a waterfall and causing land to erode upstream. Based on its investigations into the accident, BNSF believes that the flash flood propagated a head cut upstream where the BNSF bridge was located. The head-cut eroded the soft soil underneath the BNSF bridge, including retaining walls, which then washed away. BNSF has asked the National Transportation Safety Board to (1) recognize this "head-cut" phenomenon as a potential problem and (2) issue an advisory for construction in areas with caliche formations, warning that any construction activity below the caliche layer could be dangerous for structures upstream.

[13] Rochester Comments, Exhibit 2 at p. 20 and Table 3.

what might be required to effectively address existing karst features along the R-4 Alternative because no geophysical surveys have been done along the proposed alignment. SEA believes that all the investigation, mitigation and monitoring that would be required to construct and operate a line such as the R-4 bypass, where there appears to be a significant risk of sinkholes,[14] would be prohibitively expensive. (See Appendix M and discussion below).

Even if the costs could be justified, the mitigation that would be needed to construct and operate the proposed R-4 bypass could itself have potentially significant environmental impacts. Specifically, as Rochester states,[15] the railroad would have to inject huge quantities of cement grout to fill the existing sinkholes and minimize the risk of future sinkhole formation. Attempting to apply this technology would leave a significant residual level of risk of future collapse. In addition, this cementing approach could affect the flow of groundwater by essentially creating an underground "dam" or cement wall underneath the rail line. As a result, the natural underground flow of groundwater would be inhibited. Groundwater could build up on one side of the underground dam or wall, while on the other side groundwater would drain away from the area, lowering the water table, and potentially affecting wetlands, springs, streams, and rivers. Such changes in the water table could affect vegetation throughout the area, which in turn could affect wildlife and their habitat.

Furthermore, because groundwater flow is a key element in sinkhole formation, changes in groundwater flow could cause sinkholes to form in a more accelerated fashion and/or in areas along the R-4 route where they might not otherwise have formed. Finally, SEA notes that the geology south of Rochester in the area of the R-4 Alternative is similar. Therefore, any bypass to the south of the City would likely have the same problem as the proposed R-4 Alternative.

In these circumstances, SEA cannot recommend construction and operation of the R-4 bypass. On the other hand, the proposed reconstruction and operation of the R-2 route through Rochester appears to pose no threat from sinkholes. As noted earlier, the existing route has been in operation for over 100 years, and if there was a significant sinkhole problem, it presumably would have developed already.

[14] Even in areas outside the known high probability and karst areas, sinkholes could still be encountered, and significant costs would be required to mitigate them.

[15] Rochester comments, Exhibit 22 at p. 8.

9.3.3 SOIL IMPACTS

The potential impacts that the Rochester alternatives would have on soils would be similar in nature, but would affect different types of soils, and to different degrees. Because of these differences, the potential soil impacts on Alternatives R-2 and R-4 are discussed separately.

Soil Impacts of Alternative R-2: Reconstruction of Existing Rail Line

As discussed in Chapter 3 of the Draft EIS, soil disturbance from reconstruction of the existing line through Rochester would affect about 564.8 acres of soil within the right-of-way, generally limited to rail bed reconstruction areas. Impacts would be minimal – soil compaction, some erosion, and soils mixing – the same as occurred when the rail line was constructed more than 100 years ago. Thus, reconstruction would disturb only previously disturbed soils. Since soils within the existing right-of-way were taken out of agricultural production when the rail line was originally constructed, no prime farmland would be lost to this alternative. Potential impacts to soils during rail operation include erosion of soils disturbed during construction, and soil contamination from accidental spills, which could be minimized by a rapid response in the unlikely event of a train accident resulting in a fuel or chemical spill.

Potential impacts to soils from rail line reconstruction could be mitigated through best management erosion-control practices, including use of straw bales and silt fences, replanting disturbed soils as soon as possible, and limiting disturbance to areas required to reconstruct the rail bed. No significant impacts to soil are anticipated as a result of Alternative R-2.

Soil Impacts of Alternative R-4: Bypass for All Rail Traffic

Comments on impacts to soils associated with Alternative R-4 included CARB's concern that SEA might have understated potential impacts to soils in the proposed project area. As discussed in Chapter 3 of the Draft EIS, construction of Alternative R-4 would disturb and convert to rail line right-of-way approximately 826.7 acres of soil, of which 606.0 are prime farmland. Portions of the project area characterized by a thin layer of soil over fractured carbonate bedrock and sinkholes would be particularly sensitive to topsoil loss. The soil analysis in Chapter 3 of the Draft EIS and the United States Department of Agriculture (USDA) soil survey for Olmsted County indicate that many soil types in the proposed right-of-way impose severe constraints on buildings and roadways. Disturbance to soils could result in increased erosion and loss of topsoil, and soil factors such as low strength, wetness, and frost action could make construction and maintenance of Alternative R-4 difficult.

The potential operational impacts of Alternative R-4 on soil are discussed in Chapter 3 of the Draft EIS. As explained there, an accidental fuel or chemical spill from a train derailment would be the primary source of soil impact during rail line operation. But since train derailments are considered unlikely events, the potential for soil contamination is also considered unlikely.

Impacts to soils from construction and operation of Alternative R-4 could be reduced by following the same best management practices as for Alternative R-2. These include use of straw bales and silt fences to control erosion from storm water runoff, replanting disturbed soils as soon as possible, and limiting disturbance to areas required to construct the rail line.

9.3.4 PALEONTOLOGICAL RESOURCES

As discussed in Chapter 3 of the Draft EIS, any paleontological resources present within the existing rail line right-of-way were likely disturbed or destroyed when the rail line was originally constructed. Since only minimal new construction would occur within the existing right-of-way, and disturbance would generally affect only the ground surface, Alternative R-2, rehabilitation of the existing rail line, would not affect paleontological resources.

As indicated in the Draft EIS, there is a possibility that paleontological resources would be discovered during construction of Alternative R-4, particularly where deep cuts into bedrock would be necessary. However, because the geologic formations on Olmsted County are not known to be of the type to contain significant fossil resources, discovery of significant resources, such as vertebrate fossils, is considered unlikely, Alternative R-4 is not expected to have significant effects on paleontological resources.

CARB's comments supported SEA's conclusions on paleontological resources along the existing rail line, Alternative R-2. While CARB pointed out the variety of fossil resources in the geologic formations throughout Olmsted County, its discussion also supports the conclusion that paleontological resources along Alternative R-4 are scattered and unlikely to be affected. Therefore, SEA reaffirms that neither alternative would have significant effects on paleontological resources.

9.3.5 LAND USE

Potential changes in land use due to construction and operation of the Rochester alternatives are discussed in this section. Land uses were discerned by site visits and aerial photography, and the uses evaluated include agricultural, residential, business and industrial, and public lands. Although uses on both sides of the rail line were measured, only land that is, or

would be, directly adjacent to the rail line has been evaluated. Distances required to cross rivers, streams, lakes, and roadways were not included in the land use total.

9.3.5.1 Agriculture

Land is considered agricultural when used for cultivating crops, raising livestock, or as pasture. What follows is a description of the potential impacts to agricultural land from the construction and operation of the two Rochester Alternatives.

Alternative R-2: Reconstruction of Existing Rail Line

Chapter 3 of the Draft EIS, discusses potential reconstruction impacts, such as soil compaction and mixing, and crop damage, along the approximately 7.9 miles of agricultural land bordering Alternative R-2. Because rehabilitation activities would be confined to the existing right-of-way, the rehabilitation of the existing line is not expected to have any impact on agricultural land use.

There could be operational impacts due to use of herbicides to control vegetation in the right-of-way, as well as possible crop damage in the case of derailment. However, DM&E currently uses only EPA-approved herbicides, applied by licensed applicators. This creates only minimal potential for herbicides to damage agricultural vegetation outside the right-of-way, and these practices are not likely to increase the risk of crop damage once rehabilitation is completed. Since derailments are also considered unlikely, no operational impacts to agricultural lands are anticipated under Alternative R-2.

Alternative R-4: Bypass for All Rail Traffic

In the Draft EIS, SEA indicated that the Alternative R-4 project area is primarily rural, with agricultural land use dominant. Alternative R-4 would cross approximately 30.0 miles of agricultural land, with a loss of approximately 727.3 acres of agricultural land, 606.0 of which are prime farm land. Potential impacts during construction include soil compaction, erosion, crop damage, reduced access to fields, increased noise, and dust. In addition to the 727.3 acres converted to right-of-way, other newly created fragments of land could become unproductive for lack of access or insufficient size for efficient maneuvering of farming equipment when the new rail line cuts across existing fields.

CARB's comments on the Draft EIS expressed the concern that SEA had underestimated the agricultural acreage required for Alternative R-4. CARB asserts that a 200-foot right-of-way is not adequate to construct a new rail line in locations where extensive cut and fill is required.

Additionally, CARB commented that agricultural land not used for right-of-way, but left unproductive due to size or loss of access as a result of construction of Alternative R-4, was not adequately addressed in the Draft EIS.

Based on additional review of the potential impacts of Alternative R-4, SEA believes that the Draft EIS appropriately characterizes the potential impacts to agricultural land. Additional investigation confirms that for most of, if not all, the alignment of Alternative R-4, a 200-foot right-of-way should be sufficient for cut-and-fill operations. In addition, restricting construction equipment to the 200-foot right-of-way would minimize or eliminate impacts to agricultural land outside the right-of-way. Therefore, the estimate of lost agricultural acreage offered in the Draft EIS is appropriate.

While it is likely that some unproductive field fragments would be created by the new rail line, it is difficult to estimate how much of this land would actually be taken out of agricultural production. As discussed in the Draft EIS, these parcels might see continued agricultural use through sales to adjacent farmers and consolidation into other fields. Additionally, if Alternative R-4 is built, minor adjustments to the final alignment could reduce the size and number of remnant parcels, resulting in minimal impact to agricultural land. However, the remaining fragmented fields removed from production would decrease the productivity of these farms and reduce the farm income of their owners. Landowners would be compensated for land converted to rail line right-of-way, as well as for overall reductions in property value resulting from the new rail line's crossing the farm (see Section Chapter 8 for more detailed discussion).

In its comments concerning business and industrial land, CARB noted that a turkey farm is located along the proposed alignment of Alternative R-4. Because it involves poultry production, this facility is discussed in the agriculture section. As explained there, should the turkey farm actually be within the right-of-way for an approved Alternative R-4, DM&E would be required to acquire it or pay to relocate it.

Draft EIS Chapter 3 describes the potential operational impacts to the approximately 60.0 miles of agricultural land that Alternative R-4 would pass through. These include reduced access to fields that would require farmers to use public roads or unprotected private crossings to transport equipment between fields. Large, slow-moving farm equipment on public roadways could be hazardous to both equipment operators and other motorists. However, installation of farm equipment crossings of the rail line would reduce the need for farm equipment to travel over area roadways to get to the fields.

9.3.5.2 Residential

Residential land is used for human habitation, and contains farm dwellings, homes, neighborhoods, subdivisions, apartment complexes, and rural residences.

Alternative R-2: Reconstruction of Existing Rail Line

The City of Rochester requested clarification of how close to the right-of-way residential land must be in order to be considered "adjacent" to the rail line. Only land in direct contact with the right-of-way is considered adjacent to it. Using this criteria, about 1.7 miles of residential land is adjacent to the existing rail line for Alternative R-2, most of it east of the Zumbro River. Potential impacts to residential land during construction and operation include increased noise, safety concerns, traffic delays, and the general inconvenience of a rail line near homes.

SEA received many comments on the effects that increased rail operation on the existing rail line could have on residential property values. Draft EIS Chapter 3 covers potential impacts to Minnesota residential land from reconstruction and operation of the rehabilitated rail line, including impacts to property values. Since many factors affect property values, it is difficult to determine whether proposed increases in rail traffic on a line where there is already existing traffic would have any significant impact. However, some negative impact to property values could result from increased rail traffic if homes along the existing rail line are viewed as less desirable places to live. Because of the number of comments received on this issue, SEA conducted an extensive literature review to determine the factors potentially affecting real estate values and whether increased traffic on a rail line would have any significant impacts on property values.

Since residential property values are based on a number of determinants, it is difficult to pinpoint a specific attribute as the greatest influence. Important considerations may include the season of the year, economic trends in the area, how closely supply and demand for residences are matched, a property's proximity to amenities and favorable and unfavorable features, including rail lines, and the social desirability of a location. As discussed in detail in Chapter 3 of the Final EIS, all these factors combine to determine the desirability of a particular piece of real estate. SEA's additional investigation did not change the conclusions presented in the Draft EIS. While some decline in residential property values may occur as a result of the increased train traffic, SEA does not anticipate the decline would be significant.

Additional operational impacts resulting from the proposed increase in rail traffic along Alternative R-2 include increased noise and vibration, safety concerns, and traffic delays, as described in detail in Chapter 3 of the Draft EIS, as well as later in this chapter.

Alternative R-4: Bypass for All Rail Traffic

Alternative R-4's project area is primarily rural, without adjacent subdivisions or neighborhoods, and residential areas include farm homes and rural residences. CARB and others questioned the accuracy of the seven residences within 500 feet of Alternative R-4's right-of-way estimated in Chapter 3. Additional research, including site visits, determined that there would be 17 residences within 500 feet of the right-of-way, one of which would likely require removal or relocation. However, minor alignment modifications could result in impacts to only the seven residences projected in the Draft EIS.

Construction impacts to residences would include increased noise, dust, emissions from construction equipment, and increased traffic congestion from construction vehicles. Operational impacts would be similar to those of Alternative R-2, and would include increased noise, safety concerns, traffic delays, and the general inconveniences of living near a rail line.

9.3.5.3 Business and Industrial

Land uses classified as business and industrial primarily involve an enterprise, where people come to work or to purchase goods or services. Examples include industrial parks, shopping centers, business districts, and small strip malls. The same methods used to estimate the amount of residential land affected by each alternative were used to determine the amount of business and industrial land.

Alternative R-2: Reconstruction of Existing Rail Line

The Draft EIS indicated that the existing DM&E line through Rochester is adjacent to approximately 5.9 miles of business and industrial land, most of it west of the Zumbro River. Businesses adjacent to the line could experience periods of disturbance during reconstruction. Potential construction impacts would be similar to those described for reconstruction of existing rail line in other parts of Minnesota in Chapter 3 of the Draft EIS, including a potential decrease in business, traffic delays, and increased noise.

Impacts to businesses during the operation of Alternative R-2 would be similar to those described for construction, with the exception that construction impacts would be short-term, whereas operational impacts would be long-term, and include increased noise and traffic delays. Businesses most affected by noise disturbance would include hotels and motels, restaurants, and theaters near the rail line. In Rochester, however, most establishments of these kinds are more than 1,000 feet from the rail line and, therefore, significant impacts are not anticipated.

Numerous commenters – the City of Rochester, Mayo Foundation (Mayo),[16] PEMSTAR (high-tech equipment manufacturer), Olmsted County, and Rochester Area Economic Development, Inc.– raised anticipated adverse impacts on business from increased rail traffic through downtown. Among other things, they expected that these increases in traffic would:

- Detract from the appeal of Rochester to visitors,
- Create sufficient inconvenience to Mayo Clinic patients so that fewer would visit, resulting in decreased business for the clinic and its facilities, as well as for hotels and restaurants that rely on Mayo visitors,
- Cause sufficient disturbance and inconvenience to drive businesses out of the Rochester area, particularly PEMSTAR, which expressed concern that increased rail vibrations would make it impossible to operate its high-tech manufacturing service.

SEA's additional investigation included site visits of both Mayo and PEMSTAR and meetings with their representatives, as well as travels around Rochester to identify the various Mayo facilities, hotels, restaurants, and other businesses that offer services to patients. The majority of these businesses are south of the existing rail line, with Civic Center Drive between them and the rail line. Hotels nearest the existing line are about 600 feet from it, with many others farther south. Restaurants are abundant both downtown and farther south of the rail line, generally concentrated near hotels. Both hotels nearest the rail line are near the interchange of U.S. Highway 52, and U.S. Highway 14, and are separated from the rail line by Highway 14. Thus, most businesses south of the rail line are buffered from it by Highway 14 and Civic Center Drive.

Since all Mayo facilities providing patient services are south of the rail line, a patient could spend several days in Rochester without ever needing to cross the existing line, and thus never be inconvenienced by a train. In fact, only visitors from north of town would ever have to cross the rail line at all, since there are abundant lodging, eating, and entertainment facilities south of it. Therefore, SEA does not believe that proposed rail traffic increases would inhibit patients' interest in one of the premiere health-care facilities in the world.

Rochester is a community built around the medical services provided at Mayo facilities, which are concentrated in a relatively compact, campus-like environment. Tunnels and skywalks offer convenient access to Mayo and other downtown facilities, while hotel shuttle buses relieve

[16] As explained in its comments, the Mayo Foundation is the parent of a multi-entity health care organization based in Rochester, Minnesota. Mayo's affiliates include Mayo Clinic Rochester, which in turn includes St. Mary's Hospital and Methodist Hospital.

visitors of the need to drive, find parking, and walk several blocks to Mayo. Rochester is small compared to other cities with premiere medical facilities, such as Philadelphia, Baltimore, and St. Louis. Visitors to other cities very likely experience far greater inconvenience than those going to Rochester. Since they maintain their status and attractiveness to patients due to the exceptional medical care they provide, SEA expects that Mayo would too, even with additional rail traffic along the existing rail line.

Other Rochester businesses adjacent to the existing rail line are primarily light industrial and manufacturing. PEMSTAR is a manufacturer of precision analytical-testing and other high-tech equipment, and the only business along the rail line to express concerns about increased rail operations. PEMSTAR has stated that the equipment it uses and manufactures can be so sensitive to vibration that it often experiences product loss due to vibration caused by passing trains. While the loss is now tolerable because current rail traffic is low, PEMSTAR is concerned that if Alternative R-2 is approved, the additional vibration could force this company to relocate, potentially to San Jose, California where it has other manufacturing facilities.

In response to PEMSTAR's comments, SEA met with company representatives, toured the facility, and assessed the existing vibration problem. In the process, SEA learned that, due to the growth of its Rochester operations, PEMSTAR has recently acquired other facilities in Rochester, farther from the rail line. Although it considered relocating portions of its vibration-sensitive operations to the new facility, PEMSTAR did not, for other business reasons.

SEA determined that there could be substantial impact to some operations at PEMSTAR should rail traffic increase significantly on the existing rail line, and that they would be difficult to mitigate. Because PEMSTAR develops and manufactures particular pieces of equipment, tests them, then ships them to customers, several pieces are usually under development, manufacture, or testing at any given time. Some may be sensitive to vibration, others may not be. In some cases it may be feasible to isolate the equipment from vibration, while in others such isolation may be difficult and costly, ineffective, or not feasible.

The actual impact of Alternative R-2 on PEMSTAR, however, would depend on how many trains DM&E transports through Rochester. Below 50 million tons of annual coal transport, relatively few trains would pass, with minimal impact to PEMSTAR and other businesses. Above 50 million tons annually, there would be significantly more train-passing events than today, with potentially significant adverse impacts on its business.

With the exception of PEMSTAR, and in light of its additional investigation, SEA has determined that operation of Alternative R-2 would likely have little impact on business and industry in Rochester. While some disturbance and disruption may occur, it is not expected to be

significant, and rail shippers in Rochester would have access to improved rail infrastructure for shipment and receipt of goods.

Alternative R-4: Bypass for All Rail Traffic

The Draft EIS indicated that Alternative R-4 would convert approximately 2.4 acres of business and industrial land to right-of-way and would be adjacent to approximately 0.2 mile of such land use. SEA concurred with information submitted by Rochester in its initial bypass proposal, that the turkey hatchery discussed under agricultural impacts above would be the only existing business requiring relocation for construction of Alternative R-4.

CARB questioned SEA's reliance on information from Rochester for determining the potential impacts of Alternative R-4, and listed several businesses, in addition to the turkey hatchery, that would potentially be affected by the proposed Alternative R-4. The Draft EIS acknowledges that other businesses not specifically named could potentially be affected by the proposed project, although only the turkey hatchery would require removal or relocation. Therefore, SEA reaffirms its analysis in Chapter 3 of the Draft EIS. As described there, impacts to businesses and industries could include traffic delays and reduction in business activity during construction, and continued traffic delays and train noise during operation.

The Draft EIS noted that operation of Alternative R-4 could encourage additional businesses and industry to locate in the project area, a positive impact, but that would require conversion of agricultural land, with negative impacts on agricultural land use. CARB has correctly pointed out that development of business and industrial land uses along Alternative R-4 would be contrary to the General Land Use Plan for Olmsted County. While that would not preclude such development, it is less likely to occur for lack of the power, water, and sewer services sufficient to support development, and the high cost of providing these public services.

9.3.5.4 Minerals and Mining

As indicated in Chapter 3 of the Draft EIS, there are no mining facilities in proximity to the proposed Rochester alternatives. There are mining operations, including quarries and gravel suppliers, in the general area of the Rochester alternatives, but none that would be directly affected by the construction and operation of these alternatives. Aggregate and gravel suppliers could benefit from the construction of either alternative, if they can provide suitable gravel and other aggregate materials required for rail construction or reconstruction.

9.3.5.5 Public Facilities

The following describes potential impacts to facilities such as police and fire stations, libraries, churches, hospitals, and schools. More detailed discussions of them are presented under each specific type of impact – air quality, vibration, noise, transportation, and safety.

Alternative R-2: Reconstruction of Existing Rail Line

Construction and operational impacts to public facilities would be similar to those stated in Chapter 3 of the Draft EIS. Public facilities near the existing line include Mayo, with some facilities approximately 1,000 feet from the rail line, and the Federal Medical Center (FMC), a medical facility operated by the Federal Bureau of Prisons and designed to provide various levels of medical care to Federal prisoners from around the country. Potential impacts during construction would include increased dust, noise, vibration, traffic delays, and safety concerns.

Mayo commented on potential health risks of construction and operation of Alternative R-2 to its patients and Rochester. One concern was evacuating inpatient facilities during a hazardous-material spill. Another was the effect of train-generated vibrations on sensitive medical procedures such as magnetic resonance imaging (MRI) systems, microsurgical procedures, and medical research. Mayo was also concerned that a grade crossing could be blocked during an emergency response to the Mayo Clinic, delaying a patient's arrival for emergency treatment or a physician's arrival to perform after-hours emergency procedures. These comments are addressed in detail in subsequent sections of this chapter.

Like Mayo, the FMC expressed concerns that evacuation of its facility could be required by a hazardous-materials spill. It was also worried that increased vibration from passing trains would reduce the effectiveness of its security fence. There are more detailed discussions of these impacts in later sections on hazardous materials and vibration.

Alternative R-4: Bypass for All Rail Traffic

As stated in Chapter 3 of the Draft EIS, there are public facilities in the Alternative R-4 project area. However, since the nearest public facility is a church about one-half mile (2,500 feet) from the proposed rail line, impacts to public facilities as a result of construction and operation of Alternative R-4 would be minimal.

9.3.5.6 Public Lands

The following discusses SEA's additional analysis of the potential project impacts to public lands, presented by alternative.

Alternative R-2: Reconstruction of Existing Rail Line

As described in the Draft EIS, Alternative R-2 abuts about 1.9 miles of the Gordon W. Yeager State Wildlife Management Area (WMA). Potential reconstruction impacts would include increased noise, dust, and general disturbance while active reconstruction is underway. These impacts would be temporary, ceasing upon completion of reconstruction.

Operation of the rail line could create disturbance to the area from the increased number of trains. People using the WMA would experience greater disturbance from passing trains, particularly during bird watching. Rochester commented that this wildlife area is used by large numbers of Canada geese during the fall and winter months. While it is likely that passing trains would cause them to prefer parts of the wildlife area that are more distant from the tracks, SEA expects that geese would continue to use the area in similar numbers.

Alternative R-4: Bypass for All Rail Traffic

CARB commented that some potential impacts of Alternative R-4 to other WMAs were not presented in the Draft EIS. Based on their comments, construction and operation of Alternative R-4 could potentially impact the three WMAs in Olmsted County in proximity to the rail line. Alternative R-4 would be adjacent to the Nelson Fen WMA and within 0.5 mile of the Suess WMA and the South Fork Zumbro River WMA.

Nelson Fen is an 80.0-acre public hunting area containing a calcareous seepage fen approximately 0.25 mile from the north property line. Potential impacts to the Nelson Fen WMA during construction would include increased noise, dust, and general disturbance. If cuts and excavation adjacent to the Nelson Fen WMA are required, they could affect the groundwater flow upon which the fen depends. Changes that modify water quality or quantity could cause damage to or loss of the fen. Construction impacts to the Suess and South Fork Zumbro River WMAs would be less than to Nelson Fen because they will be farther from the rail line. Potential impacts would result from low levels of construction noise and increased construction traffic.

Post-construction revegetation of disturbed soils in the right-of-way could introduce noxious and exotic plant species. Since Nelson Fen is reached from State Highway 30 on the south side of the property, access to the area would not be impaired during operation of the rail

line. Because Alternative R-4 would pass 0.5 mile from the Suess and the South Fork Zumbro River WMAs, operational impacts to them would be limited to distant train noise. Re-seeding the right-of-way in accordance with Minnesota Department of Natural Resources guidelines and the use of other best management practices during and after construction would prevent establishment of noxious and exotic weeds in the rail line right-of-way.

9.3.6 WATER RESOURCES

Water resources include surface water, groundwater, and wetlands. Unique geological features found along Alternative R-4 in Olmsted County, including thin soils, fractured bedrock, and karst topography, result in close connections among the area's water resources. The project area includes places where groundwater flows to the surface as streams, where surface water streams disappear into the ground, and where groundwater seeps to the surface forming springs and wetlands. The following sections describe surface water, groundwater, and wetland resources in the project area, and potential construction and operational impacts to them. Because of the unique nature of the project area, activities or events that affect one type of water resource would likely have an impact on the other types as well.

9.3.6.1 Surface Water

Surface water resources include rivers, streams, lakes, and ponds. The potential impacts resulting from each Rochester alternative to these resources are described below.

Alternative R-2: Reconstruction of Existing Rail Line

As discussed in the Draft EIS, Alternative R-2 currently crosses 15 streams, seven perennial and eight intermittent, including one crossing of the Zumbro River. In-stream reconstruction of crossing structures and replacement or installation of culverts could disturb sediments and temporarily increase water turbidity, which would likely subside soon after work ends. Fuels, oils, and solvents used during construction would require proper management to prevent accidental spills that could result in contamination of surface water. Introduction of fuel or other contaminants into the surface water could potentially cause local degradation of water quality, possibly harming aquatic organisms.

Operational impacts to surface waters are described in the Draft EIS in Chapter 3. These generally include accidental introduction of materials such as fuels, oils, and solvents into waterways, and disturbance during maintenance. As for construction impacts, introduction of such materials into waterways could cause local degradation of water quality, and potentially harm aquatic organisms at the spill site. However, this is considered unlikely as DM&E does not

anticipate increasing the amount of hazardous material it transports, and the rail line is expected to be safer following rehabilitation. Both reconstruction and operational impacts along Alternative R-2 would be similar to those now part of normal maintenance of the existing rail line right-of-way.

Erosion control methods such as straw bales, silt fencing, mulching, and re-planting would reduce sedimentation from the disturbed right-of-way. Rapid cleanup would prevent accidental fuel or chemical spills from entering the surface water. Compliance with Department of Transportation handling and storage regulations would reduce or eliminate the risk of surface water contamination from accidental fuel or chemical spills. SEA's recommended mitigation would accomplish this result.

Alternative R-4: Bypass for All Rail Traffic

Although it is generally accepted that surface water, groundwater, and wetlands interact, the concentration of visible evidence of this in the Alternative R-4 project area makes it worth mentioning here. Construction of Alternative R-4 would require new crossings of eight perennial and 28 intermittent streams. Installation of required bridges and culverts could disturb sediments in these waterways and increase turbidity. Because this would be all new construction, impacts to surface waters along Alternative R-4 would likely be greater than those expected for Alternative R-2. Construction of crossing approaches and abutments could require stream channelization, placement of fill or excavation of the stream bank, and bank stabilization at the crossing point. This additional ground disturbance would increase the potential for erosion and sedimentation into the stream. Fills and cuts required throughout the project area could change the pattern of drainage for surface water, potentially changing stream hydrology and sediment deposition patterns. Substantial construction activity would likely be required for crossings of Salem Creek, Bear Creek, Badger Run, Willow Creek, South Zumbro River, and Cascade Creek.

Operational impacts to surface water would be similar to those described above for Alternative R-2. They would primarily involve impacts associated with accidental fuel or chemical spills.

9.3.6.2 Wetlands

Wetlands are transition zones between open water and upland systems, and are defined for regulatory purposes in the Clean Water Act. The Environmental Protection Agency and the U.S. Army Corps of Engineers (COE) define "jurisdictional" wetlands as follows:

> Wetlands are those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and, under normal circumstances, do support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, bogs and similar areas. 40 CFR 230.3 and 33 CFR 328.3.

Wetlands associated with waters of the United States (streams, rivers, lakes) are regulated by the COE under the Clean Water Act. According to a recent court ruling, Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers, 531 U.S. 159 (2001), isolated wetlands are generally not under the jurisdiction of the COE. However, many of these wetlands fall within the State of Minnesota's permitting process.

Wetland acreages for each Rochester alternative in this Final EIS were estimated using National Wetland Inventory (NWI) maps. Potential impacts to wetland areas in the project areas of the Rochester alternatives are described below.

Alternative R-2: Reconstruction of Existing Rail Line

There are approximately 25.5 acres of wetlands within the right-of-way along Alternative R-2, including approximately 1.4 acres of riverine, 1.6 acres of scrub-shrub, and 22.5 acres of emergent wetland. While it is likely that reconstruction of the existing rail line would disturb, damage, or remove some of these wetlands, only those located in areas requiring rail bed reconstruction would likely be affected. It is also probable that some wetlands were formed by changes in surface drainage patterns during original rail bed construction. Others were probably present and not destroyed by the original construction, and have been preserved from further encroachment by being in the right-of-way.

Some wetlands outside the right-of-way could be affected by reconstruction, particularly where part of the wetland overlaps the rail line right-of-way. Disturbance of soils in the right-of-way during construction could increase runoff and thus erosion of sediments into adjacent wetlands. Increased influx of sediment could degrade wetlands' habitat quality, function, and productivity. Proper application of erosion control measures in disturbed areas, such as mulching and silt-fencing, would minimize this impact. Disturbed soil from construction, and the subsequent revegetation of the right-of-way, could introduce noxious weeds into wetlands. However, only species adapted to wetland conditions would be capable of surviving and spreading, limiting the number of invasive species capable of intruding into area wetlands.

Surface water drainage under the rail line would be restored during reconstruction by opening clogged drain pipes and culverts, cleaning out drainage ditches, and replacing drainage structures where necessary. However, this could potentially allow water that is currently ponded on the uphill side of the rail bed to drain. As a result, wetlands both inside and outside the right-of-way that were formed by the damming affect of the raised rail bed could lose water or drain completely. This would result in a loss of the habitat for the wildlife that inhabit these wetlands and the functions they provide. New drainage structures would need to be designed and installed to prevent draining existing wetlands.

Wetlands within or near the existing rail line right-of-way could experience operational impacts including contamination from accidental fuel or chemical spills, and disturbance to wildlife and waterfowl from passing trains. However, only limited wildlife currently inhabit these adjacent wetlands due to the proximity of the rail line to Highway 14 and the developed nature of land along much of this alternative. It is likely that the area's wildlife could adjust to the increased disturbance of additional rail traffic.

Potential impacts to wetlands during reconstruction could be minimized or eliminated through the Clean Water Act, Section 404 permit process, which DM&E already has begun. Such permits would likely be conditioned on replacement of wetlands, use of best management practices for erosion control, maintaining the elevation of drainage structures, and confining construction to the right-of-way. Impacts to wetland hydrology could be minimized when designing and installing drainage structures to assure that they do not cause adjacent wetlands to drain. Compliance with handling and storage regulations would minimize the potential impacts from accidental fuel or chemical spills during construction and operation. Rapid response and clean-up of accidental fuel or chemical spills in the unlikely event of a derailment would minimize contamination of soils which could lead to reduced water quality in nearby wetlands.

Alternative R-4: Bypass for All Rail Traffic

Approximately 60.1 acres of wetland would be within the proposed right-of-way for Alternative R-4.[17] These wetlands would include 2.3 acres of riverine, 9.4 acres of forested, 9.6 acres of scrub-shrub wetland, and 38.8 acres of emergent wetlands. Wetlands within the right-of-way would be destroyed during construction, and those adjacent to the right-of-way, but not within its boundaries, could experience the impacts described for Alternative R-2, including increased sedimentation from erosion. Additionally, adjacent wetland areas could be damaged from heavy construction equipment where construction of the rail bed occurs near a wetland.

As discussed in the Draft EIS, conditions in the Alternative R-4 project area are suitable for calcareous fens, unique among wetlands in that they are peat-accumulating, with groundwater inflows, and specific hydrophytic plant communities. Fens are protected by Minnesota Statute 8420.1010 through 8420.1070, which prohibit draining, filling, or altering fens without a fen management plan approved by the Commissioner of the Minnesota Department of Natural Resources. Although there are no known fens within the proposed right-of-way for Alternative R-4, several are known and mapped in the project area, and it is possible that there are others in the right-of-way. Alternative R-4 would pass within 0.5 mile of Nelson Fen WMA. Because of this fen's proximity to the proposed alignment and the reliance of fens on groundwater, nearby construction of a rail line could alter groundwater patterns and the hydrology of this and other nearby fens, potentially causing them to dry up or lose the characteristics of a fen.

Operational impacts to wetlands in the Alternative R-4 project area would be similar to those discussed above for Alternative R-2, except that the wildlife along Alternative R-4 does not currently experience any such disturbance.

[17] Based on Rochester's bypass proposal submitted on June 10, 1999, minor realignment of Alternative R-4 would reduce wetland impacts to 54.2 acres, including 1.4 acres of riverine, 9.4 acres of forested, 4.1 scrub-shrub, and 39.3 acres of emergent. It appears to SEA that based on NWI maps, Rochester's realignment in Sections 30 and 31 of Rock Dell Township was intended to avoid an area of scrub-shrub wetland. This section of realignment reduces the amount of scrub-shrub wetland by 5.5 acres, riverine wetland by 0.9 acres, and emergent wetland by 2.3 acres. However, the realignment of Alternative R-4 from the center of Section 15 to the center of Section 14 of Rock Dell Township would result in a 1.8 acre overall increase in emergent wetlands based on NWI maps. In its bypass proposal submitted June 10, 1999, Rochester states that this change in the original route would avoid a major wetland area and minimize the number of dwellings impacted. It appears that additional emergent wetland area would be affected in order to minimize impacts to dwellings. However, an overall decrease in wetland impact would result from Rochester's realigned route.

Potential impacts to wetlands during the construction of Alternative R-4 could be minimized or avoided by realigning the alternative to avoid them. Further impacts to wetlands during construction would be minimized by applying best management practices for erosion control in the rail line right-of-way. Impacts to wetland hydrology could be minimized when designing and installing right-of-way drainage structures to assure that they do not drain adjacent wetlands. Compliance with handling and storage regulations would minimize the potential impacts to wetlands from an accidental fuel or chemical spill during construction or operation. Rapid response and clean-up of accidental fuel or chemical spills, should a derailment occur, would minimize contamination of soils which could lead to impacts on nearby wetlands.

9.3.6.3 Groundwater

Groundwater resources include those waters that, over varying lengths of time, have flowed into or created spaces below the ground surface. They may be stationary or flowing. Groundwater resources include springs, wells, and aquifers. Potential impacts to these resources are discussed below.

SEA received numerous comments on the groundwater discussion in the Draft EIS. Olmsted County's comments related to Rochester's groundwater recharge area, while CARB's concerned geological features that facilitate groundwater contamination, as well as the effects of cut-and-fill operations on groundwater. Based on these comments, SEA did additional analysis of the potential impacts to Rochester's well fields and other groundwater resources.

The bedrock strata beneath the uplands areas of Olmsted County (the southern half of the County) are the major source of the area's domestic water. Most of this bedrock aquifer is composed of karstic limestone and dolomite, heavily cut by streams and rivers which dewater it effectively. As the higher of two area aquifers, it recharges the St.Peter/Prairie du Chien-Jordan aquifer below it. As its name suggests, the St.Peter/Prairie du Chien-Jordan aquifer is composed of three distinct hydraulically connected layers making up a single water bearing zone from 400 to 500 feet thick underlying Rochester and supplying most of the city's drinking water. The St. Peter stratum is sandstone lying west, south, and east of the city. The Prairie du Chien stratum consists of a thin-bedded dolomite and a thick-bedded Oneota dolomite, and is the uppermost bedrock unit under Rochester, on which the South Fork Zumbro River and Bear Creek flow. Beneath this is the Jordan stratum, a fine coarse-grained sandstone.

Groundwater in the upper aquifer flows from the west, south, and east sides of the city, predominantly horizontally, above a confining layer of rock. A formation of Decorah shale begins south of Rochester and extends eastward so that the leading edge of the formation, called the Decorah edge, wraps around the eastern perimeter of Rochester in a crescent shape. At the

Decorah edge, the confining layer of rock separating the upper from the lower aquifers is gone, so the water discharges directly into the St. Peter/Prairie du Chien-Jordan aquifer and flows towards the rivers, primarily the South Fork Zumbro River. The flow is horizontal except near rivers where there is an upward gradient. Groundwater from the St. Peter/Prairie du Chien-Jordan aquifer is discharged to major streams, production wells, and underlying units as leakage. Most streams in the area are groundwater fed.

Rochester's municipal water is pumped from wells operated by Rochester Public Utility and located throughout and around the city, as far south as the Rochester International Airport and within 1.5 miles of Alternative R-4. The wells range in depth from approximately 350 to 1,045 feet deep, and produce from 105 to 1,500 gallons of water per minute. At some locations along the Decorah edge, groundwater flowing from the upper to the lower aquifer is very shallow, making it susceptible to contamination by surface activities. Because the drinking water for Rochester is drawn from wells in the St. Peter/Prairie du Chein-Jordan aquifer, commenters raised concerns about the possibility of soil contamination near the Decorah edge recharge area which could potentially lead to groundwater contamination. The overlying drift deposits there are either absent or too thin to act as a protective barrier against surface contamination, and there is already evidence of nitrate contamination in this aquifer.

Alternative R-2: Reconstruction of Existing Rail Line

Alternative R-2 utilizes the same alignment as the existing rail line, and involves only rehabilitation of the existing rail line. The existing rail line crosses the Decorah edge east of Rochester near Chester, Minnesota, and again west of the city near Byron. Rochester has indicated, and SEA has confirmed, that about 11.2 miles of Alternative R-2 cross areas classified as highly sensitive to groundwater contamination. However, it is important to note that where the existing rail line crosses these sensitive areas, the risk of groundwater contamination is increased by the possibility of a derailment and spill caused by its current poor condition. Since DM&E would not transport more or different hazardous materials following rehabilitation, Alternative R-2 would actually yield a safer route than exists today.

In evaluating the Alternate R-2 line for areas deemed sensitive to groundwater pollution, SEA determined that about a mile (4 percent) crosses an area of very high sensitivity, 11.2 miles (48 percent) cross high-sensitivity areas, 3.8 miles (16 percent) traverse areas of high-moderate sensitivity, and 7.3 miles (31 percent) cross areas of moderate to low sensitivity. About 16.0 miles of the route has a low-to-moderate probability for sinkhole formation, and 7.3 miles cross areas of low probability for sinkhole formation.

The relatively low probability of sinkholes in the area around Alternate R-2 is important because sinkholes are a direct route for surface-level contaminants to underground aquifers. After more than 100 years of operation along this line, voids in the soil would most likely have been collapsed already by the trains' loading and vibration. In other words, decades of train operation have served as an exploratory test for potential sinkholes along the existing rail line. Known sinkholes are very rare along Alternative R-2.

Alternative R-4: Bypass for All Rail Traffic

At the point where Alternative R-4 departs from the existing rail line near Eyota, Minnesota, it would cross about 6.0 miles of land up gradient of the Decorah edge, traversing the Decorah edge in two locations near the intersection of Interstate 90 and U.S. Highway 52. This area not only provides water for Rochester, but its wells also supply rural residences and farms throughout the area immediately around Alternative R-4. Some farms also use groundwater for cooling. Cut and fill in this area could greatly affect the groundwater flow pattern, and spills in this area would likely have a major impact on the quality of groundwater.

Compared to the geological strata beneath much of Alternative R-2, the geological strata beneath most of Alternate R-4 is more susceptible to karst formation, with 1.4 miles of the rail line crossing areas classified as karst, or dominated by sinkholes. Another 6.3 miles would cross areas of moderate-to-high sinkhole probability, 19.4 miles would cross low-to-moderate areas, and 7.0 miles would cross areas of low probability for sinkhole formation. That known sinkholes are very common along portions of Alternative R-4 is due in large part to the fact that the bedrock strata beneath it is subject to a significant amount of solutioning (dissolving) of the bedrock. Eleven known sinkholes are located along Alternative R-4.

The potential for groundwater contamination increases with the amount of karst in the area, because sinkholes provide direct access to the aquifer. In evaluating Alternative R-4, SEA determined that approximately 7.5 miles (21 percent) would cross areas classified as very highly sensitive to groundwater pollution, around 5.6 miles (16 percent) would cross high-sensitivity areas, 18.9 miles (55 percent) would cut across area of high-moderate sensitivity, and 3.0 miles (8 percent) would traverse areas of moderate-to-low sensitivity to groundwater pollution.

In the absence of sinkholes, contaminant infiltration into groundwater would be impeded or stopped by surface soils, which trap contaminants and enable them to be removed. However, sinkholes are chimney-like structures extending from the surface to the bedrock aquifers, allowing water, runoff, and other materials to run down them, much like a drain, directly into the aquifer. Any contaminants reaching a sinkhole would be carried to the aquifer nearly instantly. In the case of a sudden release, such as a large, accidental spill, this geologic setting is much worse than any

of the other ratings, even the "high" rating. This is because emergency spill containment measures, if implemented quickly, would likely be able to control most (or at least some) of the spill in any of the other geologic settings, based on even slight retardation that could hold some of the contaminants back for even a couple of hours. This would not be true in the "very high" sensitivity areas, where a spill would likely disappear into the ground in a matter of minutes to a few hours.

Due to the karst topography along Alternative R-4 making it more susceptible to groundwater contamination, Alternative R-2 would be the preferred alternative to protect groundwater resources.

9.3.7 AIR QUALITY

The Draft EIS presented SEA's analysis of the potential impacts to air quality anticipated as a direct result from construction and operation of the various Rochester alternatives. SEA calculated and determined the increases in emissions of criteria pollutants anticipated to occur for the various Rochester alternatives at the three analyzed levels of rail traffic (20, 50, and 100 million tons of coal transported annually). SEA determined that Alternative R-2 would exceed EPA's major stationary source thresholds for oxides of nitrogen (NO_X) at the 50 and 100 million ton level, while Alternative R-4 would exceed these thresholds for carbon monoxide (CO) at the 100 million ton level and for NO_X at all levels of traffic. Despite exceeding the stationary thresholds, SEA determined for the reasons explained in the Draft EIS that neither alternative would exceed EPA's National Ambient Air Quality Standards (NAAQS) or EPA's Prevention of Significant Deterioration (PSD) increments.[18] SEA also determined that fugitive coal dust would not be a significant air quality issue. Therefore, SEA concluded in the Draft EIS that the potential air quality impacts in the city of Rochester and Olmsted County would not be significant.

SEA received numerous comments related to air quality impacts presented in the Draft EIS. Many of these comments were received from the City of Rochester, Olmsted County, Minnesota Department of Natural Resources, and the Minnesota Pollution Control Agency. Comments received pertained to a variety of issues. Overall, most of the commenters expressed the position that, contrary to SEA's conclusions in the Draft EIS, the proposed project, particularly Alternative R-2, would have significant adverse impacts on air quality in Rochester. According to the commenters, these adverse impacts would result from increased locomotive NO_X emissions contributing to higher levels of ozone, increased emissions of various hazardous

[18] Consistent with other Board cases, SEA has used the EPA standards as the best evidence of potentially significant air quality impacts in this case. For additional information, refer to the discussion below and Section 3.2.8 of the Draft EIS.

air pollutants (HAPs), and increased emissions of particulates. Additionally, commenters stated that increased emissions of sulfur dioxide (SO_2) would jeopardize Rochester's attainment status for this criteria pollutant. Allegedly, the overall emissions from increased rail operations would contribute to a deterioration of Rochester's air quality and cause significant health related effects. Commenters also expressed concern that fugitive coal dust would contribute to reductions in Rochester's air quality.

Because of the numerous comments and concerns regarding air quality, SEA will clarify its analysis of potential air quality impacts of the two Rochester alternatives. Impacts to air quality associated with the construction and operation of the Rochester alternatives are discussed in Chapter 3 of the Draft EIS. Emission levels expected for all Rochester alternatives are discussed in Chapter 3 of the Draft EIS. SEA's air quality analysis for the Rochester alternatives properly determined that, although some of EPA's thresholds for stationary air emission sources would be exceeded (particularly for NO_x and CO), neither the NAAQS nor the PSD increments for Class II areas would be exceeded.

Overall, as explained below, neither of the two Rochester alternatives (R-2 and R-4) would result in significant reductions to air quality, present a potential health hazard, or result in reclassification of Rochester and Olmsted County as a non-attainment area.

As explained in the Draft EIS, SEA conducted a detailed analysis of the potential impacts of the proposed project alternatives based on the anticipated emissions of criteria pollutants from operating locomotives at three levels of operation — 20 million tons of coal transported annually or 11 trains per day, 50 million tons of coal transported annually or 21 trains per day, and 100 million tons of coal transported annually or 37 trains per day. The anticipated increases in locomotive emissions for Alternatives R-2 and R-4 are presented in Table 9-1 for each anticipated level of project-related rail operations.[19]

[19] Table 3.3-12 in the Draft EIS also contained data for increased locomotive emissions from the Rochester alternatives.

Table 9-1
Emission Levels of Proposed Alternatives for Rochester, MN

Alternative	Number of Trains/day	Emissions Levels					
		HC (tpy)	CO (tpy)	NO_X (tpy)	SO_2 (tpy)	PM_{10} (tpy)	Pb (tpy)
		Increase	Increase	Increase	Increase	Increase	Increase
R-2	11 trains	6.01	16.17	96.31	10.12	4.07	0.000331
	21 trains	16.18	49.48	259.09	27.21	10.95	0.000683
	37 trains	32.16	86.43	515.00	54.09	21.77	0.001769
R-4	11 trains	9.74	26.51	157.70	16.81	6.66	0.000542
	21 trains	24.49	66.45	395.92	42.01	16.73	0.001360
	37 trains	48.81	129.30	770.45	80.92	32.56	0.002646

HC - Hydrocarbons CO - Carbon Monoxide PM_{10} - Particulate Matter (less than 10 microns in diameter)
SO_2 - Sulfur Dioxide NO_X - Oxides of Nitrogen Pb - Lead tpy - tons per year

After calculating the potential increased locomotive emissions of criteria pollutants (NO_X, SO_2, HC, PM_{10}, CO, and Pb), SEA compared the estimated emissions to EPA's major source thresholds for stationary sources. As discussed in the Draft EIS, no thresholds are currently established for mobile emission sources, such as locomotives. Therefore, consistent with Board precedent, increases in locomotive emissions for this project were compared to the major source thresholds for stationary sources (such as power plants) to determine whether the increases could be considered potentially significant.

Stationary emission sources which exceed one or more of the major source thresholds are classified as major stationary sources by EPA and are required to obtain a permit from EPA for their emissions. Part of the process of obtaining the permit requires dispersion modeling of the pollutant anticipated to exceed the threshold and to also determine if it would be present in concentrations sufficient to violate NAAQS or the PSD increments. If the pollutant does not exceed the thresholds established in 40 CFR Part 52.21, EPA will allow construction.

As can be seen in Table 9-1, increases in HC, SO_2, PM_{10}, and Pb do not exceed EPA's thresholds at any level of operations for either of the Rochester alternatives. Therefore, in keeping with EPA's standards, SEA considers these increases to be insignificant. In fact, 40 CFR Part 52.21 states that any modeling impact levels below the significance levels will not be considered to cause or contribute to a violation of the NAAQS. Additionally, Alternative R-2

would not exceed EPA's thresholds for CO emissions at the three levels of anticipated tonnages of coal transported. Therefore, CO emissions along Alternative R-2 are considered insignificant.

SEA determined that increases in NO_X emissions for Alternative R-2 would exceed EPA's thresholds at the 50 and 100 million annual ton levels of coal transported annually and that Alternative R-4 would exceed the thresholds at all three levels of operations (Table 9-1). Additionally, Alternative R-4 would exceed EPA's thresholds for CO at the 100 million ton level. Because EPA's thresholds would be exceeded in certain circumstances, SEA conducted additional analysis of locomotive emissions, including dispersion modeling, which EPA would require for a major stationary source (Draft EIS, Appendix E). SEA's dispersion modeling provided information on the potential concentrations of criteria pollutants expected to result from locomotive emissions. SEA compared the results of this modeling to NAAQS.

NAAQS are an air quality standard established by EPA for the protection of human health and welfare. They provide the maximum allowable concentrations for criteria pollutants in a particular county, and take into consideration other emissions sources inside and outside the county that could affect the county under evaluation. If concentrations of a criteria pollutant are below NAAQS, the area is classified as "attainment" for that pollutant. If concentrations of a criteria pollutant are above NAAQS, the area is classified as "non-attainment" for that pollutant.[20] Table 9-2 compares the modeled maximum concentrations of NO_X and CO for Alternatives R-2 and R-4.[21]

[20] In the past, Rochester has experienced elevated levels of SO_2, to the point that Rochester was considered non-attainment for this pollutant. Rochester has been able to reduce and control its SO_2 concentrations and is no longer classified as non-attainment. SEA received comments that the added SO_2 emissions from the proposed project could jeopardize Rochester's attainment status, potentially resulting in Rochester again being classified as non-attainment for SO_2. However, because the proposed project would not increase SO_2 levels above EPA's thresholds, SO_2 emissions would be considered insignificant (40 CFR 52.21).

[21] Modeled maximum concentrations are for Alternative C due to SEA identifying Alternative C as the environmentally preferred alternative, should the Board approve DM&E's proposal. See Chapter 3.

Table 9-2
Comparison of Modeled Concentrations of NO_X and CO to EPA's National Ambient Air Quality Standards

Alternative	Level of Rail Operations	NO_X Concentration*	NAAQS Concentration*	PSD Signigicance Level (NOX)	CO Concentration*	NAAQS Concentration*	PSD Significance Level (CO)
R-2	50 MNT	0.04	100 (annual average)	1 (annual average)	N/A	—	
R-2	100 MNT	0.08	100 (annual average)	1 (annual average)	N/A	—	
R-4	20 MNT	0.02	100 (annual average)	1 (annual average)	N/A	—	
R-4	50 MNT	0.04	100 (annual average)	1 (annual average)	N/A	—	
R-4	100 MNT	0.08	100 (annual average)	1 (annual average)	3.90 0.68	40,000 (1 hour average) 10,000 (8 hour average)	2,000 (1 hour average) 500 (8 hour average

* All concentrations are in micrograms per cubic meter.

As can be seen in Table 9-2, neither of the Rochester alternatives would produce concentrations of CO or NO_X that would approach, let alone exceed EPA's NAAQS. Therefore, the city of Rochester and Olmsted County would remain in attainment status for these pollutants. Air quality in Rochester and Olmsted County would remain acceptable and be considered within levels suitable for human health and welfare.

SEA conducted one additional comparison of the emissions concentrations presented in Table 9-3. SEA compared these emissions concentrations to the PSD increments. PSD increment standards are established by EPA to keep areas with acceptable air quality (concentrations of criteria pollutants are below NAAQS) from being degraded. PSD increment standards allow only certain increments (increases) above existing background conditions for criteria pollutants. Because Rochester is a Class II airshed under PSD increment standards, SEA compared the concentrations of pollutants from Table 9-2 to the PSD Class II allowable

increases. However, as no PSD increments have been established for CO, only NO_X was compared (Table 9-3).

Table 9-3
Comparison of Modeled Concentrations of NO_X to Prevention of Significant Deterioration Class II Increments

Alternative	Level of Rail Operations	NO_X Concentration*	PSD Increment*	PSD Significance Level
R-2	50 MNT	0.04	25 (annual average)	1 (annual average)
R-2	100 MNT	0.08	25 (annual average)	1 (annual average)
R-4	20 MNT	0.02	25 (annual average)	1 (annual average)
R-4	50 MNT	0.04	25 (annual average)	1 (annual average)
R-4	100 MNT	0.08	25 (annual average)	1 (annual average)

* All concentrations are in micrograms per cubic meter.

As with comparison to NAAQS, the NO_X impacts are insignificant. Therefore, the proposed project's locomotive emissions of criteria pollutants, based on EPA's thresholds designed to protect human health and welfare, would have no significant impact on air quality.

In addition to concerns regarding criteria pollutants, commenters also raised concerns about hazardous air pollutants (HAPs) that would result from the proposed project. HAPs, also known as air toxics, are pollutants known or suspected to cause cancer or other serious health or environmental effects. EPA recently released its Final Rule - Control of Emissions of Hazardous Air Pollutants from Mobile Sources (*Federal Register*, March 29, 2001), addressing HAPs. Provisions in the Clean Air Act, as amended in 1990, have resulted in efforts by EPA to characterize, prioritize, and control HAPs emissions. For mobile sources, these measures have included reformulated gasoline for automobiles, low-emissions vehicles, Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and standards for non-road vehicles

and equipment (including locomotives, the emissions of which are currently being reduced by 40 CFR Parts 85, 89, and 92, as presented in the April 16, 1998 *Federal Register* Notice). These mobile source control measures have been implemented to control some criteria pollutants (NO_X, CO, and PM_{10}). However, they have also resulted in reductions of HAPs. EPA's Final Rule addresses 21 hazardous compounds emitted by automobiles and trucks, and establishes a Technical Analysis Plan to continue to improve understanding of HAPs and evaluate the need to implement additional controls of HAPs emissions.

EPA is the Federal agency responsible for implementation of air emissions standards for the protection of human health and welfare. In addition to the NAAQS and PSD increments, EPA has also established rules for the regulation of locomotive emissions (40 CFR Parts 85, 89, and 92), and, as noted above, has recently established rules for controlling HAPs from a variety of mobile sources. EPA intends that both these rules will be effective in reducing emissions of criteria pollutants and HAPs from locomotives, automobiles, and trucks. Therefore, SEA has recommended, as outlined in Chapter 12, that DM&E be required to comply with EPA's locomotive emissions standards as part of any approval of the proposed project by the Board. SEA is confident that compliance with EPA's standards, developed for the protection of human health and welfare, will result in continued good air quality in Rochester and no significant adverse impacts from project-related HAPs emissions.

In addition, SEA conducted additional analysis to determine the potential maximum concentrations of HAPs emissions that could occur as a result of locomotive emissions. SEA compared these locomotive emissions concentrations to concentrations considered by EPA to pose a potential risk to human health. Table 9-4 presents this comparison.

Table 9-4
Comparison of HAPs Concentrations* of Concern with HAPs Concentrations from Locomotive Emissions

Hazardous Air Pollutant	Concentration from Locomotive Emissions	Risk-Based Concentration**
Naphthalene	0.0011	3.3000
Benzene	0.0067	0.2200
Toluene	0.0024	420.0000
Fluorene	0.0001	220.0000
Xylenes	0.0017	7300.0000

Table 9-4
Comparison of HAPs Concentrations* of Concern with HAPs Concentrations from Locomotive Emissions

Hazardous Air Pollutant	Concentration from Locomotive Emissions	Risk-Based Concentration**
Formaldehyde	0.0007	0.1400
Acetaldehyde	0.0002	0.8700
Acrolein	<0.0001	0.0210
Chrysene	<0.0001	0.8600
Acenaphthene	<0.0001	220.0000
Anthracene	<0.0001	1300.0000
Fluoranthene	<0.0001	150.0000
Pyrene	<0.0001	110.0000
Benz(a)anthracene	<0.0001	0.0086

* All concentrations are in micrograms per cubic meter
** EPA Region III, Risk-Based Table Concentration Table - May 2001 Update. Available online at www.epa.gov/reg3hwmd/risk/riskmenu.html.

As can be seen in Table 9-4, none of the anticipated concentrations of HAPs from locomotives would equal or exceed EPA's risk concentrations. In all cases, locomotive HAPs concentrations would be significantly below concentrations considered to present potential health risks. For example, locomotive benzene emissions, which would be the closest to EPA risk concentrations for benzene, would still be over 30 times lower than levels considered by EPA to pose a potential risk. All other HAPs emissions would be over 1,000 times lower than EPA risk concentrations. SEA, therefore, concludes that project-related locomotive emissions would not pose a threat to human health.

As noted previously, SEA received many comments regarding the potential impacts of fugitive coal dust. SEA discussed in the Draft EIS that PRB coal has a higher moisture and clay content than other, eastern coals known to produce fugitive dust. However, SEA could find no evidence that PRB coal produced significant amounts of fugitive dust from transporting on rail cars. SEA therefore concluded that although some fugitive dust may occur, it would not be

significant. Due to comments received on the Draft EIS asserting that fugitive coal dust would be a problem and would result in reduced air quality and potential health impacts, SEA conducted additional investigations into the potential for fugitive coal dust to occur as a result of operation of Alternative R-2. This additional investigation is discussed in detail in Chapter 3 of this Final EIS.

To summarize, SEA obtained additional information substantiating the differences in eastern and western coal. SEA also determined that several of the differences in PRB and eastern coals are directly linked to the potential for the coal to produce fugitive dust. Higher moisture content and larger size pieces associated with PRB coal would reduce the potential for fugitive dust formation. SEA conducted additional consultation with communities through which large amounts of coal, both PRB and eastern, are transported. While communities along rail lines transporting eastern coal tended to have heard of the issue of fugitive coal dust, communities along PRB rail lines were unaware of a potential problem. Several of these western communities currently have significantly more coal trains passing through them than are contemplated as part of the operation of Alternative R-2, even at the 100 million ton annual level of operation. SEA therefore re-affirms its conclusion the Draft EIS, that while some fugitive coal dust may be noticed along the rail line, it poses no significant environmental concern.

Overall, both of the Rochester Alternatives, R-2 and R-4, would have only insignificant impacts to air quality in the city of Rochester and Olmsted County. Both alternatives would result in increased air emissions. SEA indicated in the Draft EIS (Chapter 3) that construction and operation of Alternative R-4 would result in more locomotive emissions than would be expected from Alternative R-2 because the longer length of Alternative R-4 would require greater fuel usage (approximately 1.6 million gallons annually at the 100 million ton level of annual operations, as discussed in more detail under Energy Resources). However, these emissions would not exceed either NAAQS or PSD increments.

Generally, SEA received no comments on the air quality impacts of Alternative R-4. However, CARB did comment that air emissions along Alternative R-4 have the potential to affect Rochester as the prevailing winds would carry the emissions from the Alternative R-4 alignment into Rochester. SEA determined that the prevailing winds in Olmsted County are from the south only approximately 30 percent of the time. During these times, emissions from locomotives operating along the eastern half of Alternative R-4 would be blown toward Rochester. As with emissions along Alternative R-2, any emissions reaching Rochester from Alternative R-4 would be insignificant. Therefore, SEA concludes that while Alternative R-4 would have greater air emissions, neither Rochester alternative would result in significant impacts on air quality.

9.3.8 NOISE AND VIBRATION

Chapter 3 of the Draft EIS, states that either reconstruction and operation of the existing rail line through Rochester (Alternative R-2), or construction and operation of the Rochester bypass (Alternative R-4) would bring increased noise and vibration. Construction along either proposed alternative would result in a temporary increase in noise, while the greater rail traffic of both alternatives would permanently increase operational noise, albeit in different locations. In the Draft EIS, SEA determined the number of noise sensitive receptors (e.g., homes, schools, churches, hospitals) potentially affected by train noise by calculating the distance (contour) from the rail line where the average daily noise level (L_{dn}) would be equal to 65 dBA and to 70 dBA.[22] SEA first calculated the number of affected noise sensitive receptors under DM&E's existing rail operations in Rochester. SEA then determined the number of noise sensitive receptors that would be exposed to noise levels of 65 and 70 dBA L_{dn} at the three levels of rail traffic SEA has analyzed (20, 50, and 100 million tons of coal transported annually). The number of noise sensitive receptors within each contour were counted for each Rochester alternative and are presented in Tables 3.3-13 through 3.3-16 of the Draft EIS.

SEA also evaluated the potential impacts of increased vibration, noting in the Draft EIS that any structures within 100 feet of the rail line could be damaged by greater rail-related vibration from operation of heavier, longer, and faster trains. As explained more fully in the Draft EIS, project-related vibrations could disturb property owners in structures between 101 and 200 feet from the line but it is unlikely that vibration levels would actually damage property. There is less likelihood of disturbances for property between 200 and 400 feet from the line. SEA presented the estimate of structures potentially affected by vibration along the Rochester alternatives in Chapter 3 of the Draft EIS.

SEA received many comments on its analysis of potential noise and vibration impacts. As discussed more fully below, SEA did additional analysis in response to the comments received. As explained in this Chapter, SEA has determined that it applied the correct noise methodology. SEA believes that the results of the noise and vibration analysis in the Draft EIS is generally accurate, and indeed, that it may have slightly overstated the potential impacts of project-related noise.

In this Final EIS, SEA agrees with some of the commenters that the potential impacts of project-related train wayside noise under the R-2 route through the City of Rochester would be significant and greater than the potential noise impacts along the more rural and less populated R-

[22] 65 dBA is the threshold in the Board's environmental rules pertaining to noise, and 70 dBA is the threshold level for mitigation used by the Board in prior cases. See Chapter 3, page 3.20.31 of the Draft EIS.

4 bypass route. In Chapter 12 of the Final EIS, SEA has recommended mitigation to address the potential noise impacts along the R-2 route and at other appropriate locations outside the Rochester area that would be adversely affected by noise related to this project.[23]

9.3.8.1 Noise

Mayo commented that the effect of increased noise levels on its patients' sleep patterns was understated in the Draft EIS. While Mayo agreed that more noise sensitive receptors would be affected along Alternative R-2 than R-4, it also felt that this point was understated in the Draft EIS. Olmsted County and the City of Rochester both questioned SEA's method for determining rail noise impacts, even though SEA's methodology is the same method SEA has used in prior cases. The following sections summarize the Draft EIS analysis and present the results of additional analysis conducted by SEA as a result of Draft EIS comments received.

Alternative R-2: Reconstruction of Existing Rail Line

As discussed in Chapter 3 of the Draft EIS, Alternative R-2's reconstruction work would temporarily increase noise levels, and its operation would result in a long-term increase in ambient noise. Existing noise sources in the Alternative R-2 project area include automobile and truck traffic, construction activities in downtown Rochester, and noise associated with the existing DM&E rail line through Rochester. While the urban and suburban areas along Alternative R-2 would expose more noise sensitive receptors to reconstruction noise, this construction noise would be similar to existing urban noise sources in Rochester (building and road construction and vehicle and truck traffic). In addition, since reconstruction of the existing rail line would progress at approximately one mile per day, exposure of individual noise sensitive receptors to reconstruction noise would be limited to only a few days at most.

During operation of Alternative R-2, SEA acknowledged in the Draft EIS, numerous noise sensitive receptors would be exposed to increased noise at or exceeding 65 dBA L_{dn}. The number potentially exposed to adverse levels of noise is shown in Chapter 3, Tables 3.3-13 through 3.3-16 of the Draft EIS.

Several commenters questioned the accuracy of SEA's count of noise sensitive receptors, stating that SEA's tables presented different numbers of noise sensitive receptors potentially affected at the various levels of rail traffic. However, the tables in the Draft EIS are accurate.

[23] Consistent with the Board's approach in other cases, SEA's mitigation addresses wayside noise. SEA is not recommending mitigation for horn noise because of potential safety concerns in the absence of Federal Railroad Administration standards addressing this issue.

The numbers in one table (Table 3.1-10) represented only the receptors along the existing rail line within the City of Rochester, while the others (Table 3.3-13 through 3.3-16) presented receptors in Rochester, Byron, Chester, and other areas outside the city limits of these communities.

Some commenters requested the number of noise sensitive receptors that would experience noise levels in excess of 70 dBA L_{dn}. However, consistent with prior cases, SEA did not determine the maximum noise exposure from this project, nor did it develop noise contours for levels other than 65 and 70 dBA L_{dn}.

As in past cases, SEA presented the number of receptors within the 70 and 65 dBA L_{dn} contour distances to permit a comparison of potential noise impacts for each Rochester alternative. SEA developed these contours using the methodology described in Appendix F of the Draft EIS, and determined the number of noise sensitive receptors within each contour using recent aerial photography. Based on additional analysis, SEA believes that the information on noise receptors presented in the Draft EIS is generally accurate, and indeed that SEA most likely overestimated the number of potentially affected receptors, for three reasons:

- Only noise generated by passing trains was considered, without measuring existing ambient noise levels in Rochester, which were as high as 74 dBA at certain locations and times in May of 2001.[24] Where noise is already high, only exposure to noise in excess of the ambient noise level would contribute to overall noise impact.

- SEA did not consider the potential effects of shielding, by which buildings closer to the rail line absorb or reflect noise, reducing the noise that reaches buildings farther away. This shielding effect means that noise generated by this project will not penetrate as far from the rail line as would otherwise be the case.

- By using aerial photos, SEA probably overestimated the actual number of residences by including small businesses and garages that look similar to homes from the air.

SEA therefore stands by its noise methodology and believes that the counts of noise sensitive receptors potentially affected by Alternative R-2 are generally correct. The actual number of receptors could prove to vary slightly from the numbers given in the Draft EIS. But even if this is the case, this would not affect SEA's conclusion that Alternative R-2 would have

[24] See Appendix M of the Final EIS.

significant noise impacts — warranting the recommended noise mitigation discussed in Chapter 12 — and that the potential noise impacts exceed those under Alternative R-4.

As noted previously, Mayo is concerned that increased noise from passing trains would affect hospitalized patients' ability to sleep and obtain appropriate rest for recuperation. Through consultation with Mayo representatives and additional site visits, SEA determined that the majority of overnight patients are admitted either to St. Mary's Hospital or to Methodist Hospital.

Because St. Mary's is outside the 65 dBA L_{dn} noise contour, patients admitted to that facility would be unaffected by Alternative R-2. However, Methodist Hospital would be within the 65 dBA L_{dn} contour for horn noise, and its north wall would be within the 70 dBA L_{dn} contour for horn noise. Because of the hospital's orientation, patient rooms on the north and east sides of the building, having exterior windows, would be most affected by increased train noise. Since the noise-reduction value of an exterior wall with a window is 15 to 20 dBA, rooms on the hospital's east side would likely experience noise of 55 dBA or less. While such a level is not considered quiet, it is close to the noise level generated inside the hospital itself.

Similarly, rooms on the north side of Methodist Hospital would be largely shielded by Charter House, which is north of and nearly as tall as Methodist Hospital. Combined with the noise reduction provided by the hospital's exterior wall, this shielding will likely reduce noise by 20 to 30 dBA. With such a reduction, patient rooms on the north side of the hospital would likely be more affected by noise sources within the hospital than by rail-related noise. Therefore, SEA does not anticipate that Alternative R-2 would significantly disturb Mayo's overnight patients.

SEA acknowledges that train noise would increase under Alternative R-2, and that this increase could disrupt people's lives. Based on results of SEA's noise impact studies, selection of Alternative R-2 would, in SEA's opinion, merit mitigative measures to minimize the impact of increased train traffic on noise sensitive receptors. SEA's recommended mitigation is set out in Chapter 12.

Alternative R-4: Bypass for All Rail Traffic

As stated above, SEA indicated in the Draft EIS that noise sensitive receptors along Alternative R-4 would be exposed to increased levels of noise as a result of construction and operation of Alternative R-4. However, due to the rural nature of the area along this alternative, the number of receptors impacted would be substantially less than the number affected by Alternative R-2. The receptors potentially affected by operation of Alternative R-4 were presented in Chapter 3, Table 3.3-15 and 3.3-16 of the Draft EIS. SEA received no comments

concerning the impacts of Alternative R-4 to noise sensitive receptors that warranted further analysis.

9.3.8.2 Vibration

Chapter 3 of the Draft EIS stated that operation of any Rochester alternative would likely increase ground vibration from longer, faster, and heavier trains, and that structures within 100 feet of the line would experience the greatest impact. SEA determined that those more than 400 feet from the line would not likely experience significant impact from vibration. The Draft EIS, however, indicated that one notable exception could be facilities using sensitive medical equipment such as MRIs, analytical scales, electron microscopes, and other vibration-sensitive medical equipment.

SEA received numerous comments on the potential increase in ground vibration from operation of this project, and its impact on facilities near the existing rail line. As a result of these comments, SEA conducted additional analysis of vibration impacts. The following section summarizes potential vibration impacts presented in the Draft EIS, and presents the results of SEA's additional vibration analysis.

Alternative R-2: Reconstruction of Existing Rail Line

In the Draft EIS, SEA determined the number of structures which could be affected by the increased vibration from operation of Alternative R-2. For each vibration impact distance studied (within 100 feet for potential structural damage, between 101 and 200 feet for sufficient vibration to cause concern for damage, and 201 to 400 feet for disturbance from vibration) the number of affected structures is presented in Chapter 3, Tables 3.2-21 and 3.3-17 of the Draft EIS. The City of Rochester pointed out that while Table 3.2-21 indicates a total of 254 structures within 400 feet of the existing DM&E rail line, Table 3.3-17 indicates 576 structures within this same distance. However, there is no discrepancy because the number listed in Table 3.3-17 includes all structures along Alternative R-2, which includes Rochester, Byron, Chester, and unincorporated portions of the county, while the figure in Table 3.2-21 is only for the City of Rochester.

Chapter 3 of the Draft EIS also discussed potential vibration impacts from operation of Alternative R-2 upon vibration-sensitive equipment found at the Federal Medical Center (FMC), Mayo, and PEMSTAR. SEA determined that operation of Alternative R-2 would have no adverse impact on the security fence at the FMC. However, according to the Draft EIS, vibration from Alternative R-2 could affect MRI equipment in the Charlton North Building of Mayo, and SEA preliminarily concluded that if Alternative R-2 were approved, additional testing should be conducted. SEA also indicated that PEMSTAR had asserted that increased vibration along

Alternative R-2 would preclude continued operations in its facility adjacent to the existing rail line. At publication of the Draft EIS, PEMSTAR had not provided information on the vibration specifications of its equipment, so SEA was unable to determine whether PEMSTAR would experience any impacts, and if so, at what level, resulting from operation of Alternative R-2.

SEA received numerous comments on the potential impacts of rail vibration. Many residents along DM&E's existing rail line were concerned about potential vibration damage to their homes. Rochester indicated concern that the FMC security fence would not function properly, and sent correspondence from the U.S. Army Corps of Engineers concluding that rail vibration would adversely affect the system. Rochester also stated that the additional vibration would cause PEMSTAR to cease operations at its facility adjacent to the rail line. Mayo expressed concern that increased rail vibration would have negative effects on the operation of MRIs, would prevent the installation of a new open-sided MRI, and would interrupt various research programs and activities such as microsurgery and fertility programs.

In response to these comments, SEA met with FMC representatives, toured the security fence, and gave the fence's manufacturer information on existing and proposed rail operations and the distance between the fence and the existing line. Consistent with SEA's conclusion in the Draft EIS, the manufacturer's response (see Appendix C) is that FMC's security system can be programmed to recognize events such as passing trains. Such programming would prevent false alarms while maintaining the system's sensitivity, and could be done during normal system maintenance.

In addition, vibration tests SEA conducted at various locations in Rochester indicated that peak acceleration and velocities measured at 50 feet from the track were within 0.01 g and 0.01 in/second. These are relatively small magnitudes compared to the motion expected from an attempt to breach the fence. Based on the results of these tests, ground-borne vibration from increased train operations, even with longer, heavier, and faster trains, would not significantly exceed existing non-rail related sources of vibration. Therefore, during project operation, vibration levels should be similar to those already present. SEA also learned from the alarm system manufacturer that systems similar to those of FMC are used at a variety of rail-related facilities with no adverse impacts. No significant impacts from vibration are therefore expected to occur to FMC.

Responding to Mayo's concerns about potential adverse impacts to MRI equipment, microsurgery, and numerous research programs, SEA met with Mayo representatives. To better understand Mayo's concerns and issues, SEA determined the locations of the activities of concern and toured the MRI facilities, which are located in the Charlton North Building, approximately 800 feet from the existing rail line, as noted in the Draft EIS.

SEA learned that Mayo already has a significant vibration problem. Research on the cellular and molecular level is extremely sensitive to vibration, including that caused by heating, ventilation, and air conditioning equipment. Persons involved in such research have succeeded in identifying and eliminating adverse vibration sources or, in most cases, isolating their equipment to minimize or eliminate the effects of existing vibration. However, Mayo personnel are concerned that heavier, longer, and faster trains would add to their problem.

SEA was told that Mayo's vibration-sensitive activities are currently housed in the Gonda Building (about 1,500 feet from the existing rail line) and the Guggenheim Building (approximately 2,200 feet from it). Mayo representatives also provided additional information on the vibration sensitivity of MRI equipment in the Charlton North Building, Mayo's primary MRI examination center, which currently houses 10 MRIs, with room for two more. Mayo would like to add an open-sided MRI in this building as well. According to Mayo, even imperceptible vibrations can affect MRI results by producing fuzzy or cloudy pictures, as though the patient had moved during the test. Since vibration and patient movement can affect MRI results in the same way, Mayo can't be sure whether existing train operations affect existing MRIs. However, as part of acquiring and installing an open-sided MRI unit, Mayo conducted vibration tests to determine whether one could be installed in the Charlton North Building. Mayo indicated that, during passage of a DM&E train, its tests showed a significant peak in vibration levels that significantly exceeded the manufacturer's specifications for maximum allowable vibration for the open-sided MRI. However, for the reasons presented below, SEA's review of the data suggests that the peak was due to mechanical equipment in the building, not to train operations.

To better understand the nature and extent of the potential vibration problem at Mayo, SEA, in cooperation with Mayo, conducted vibration tests in the Charlton North Building. (See Appendix M for a summary of this testing). SEA's vibration tests produced two significant results. First, SEA confirmed that Mayo currently has a significant vibration problem. In the Charlton North Building, SEA identified vibration from several interior sources, including heating/ventilation/air-conditioning equipment, Mayo's internal file transfer system, and a water fountain outside the testing room. All these sources, however, were below levels considered adverse to the operation of the existing MRI equipment.

Second, SEA recorded vibration from passing DM&E trains in May 2001.[25] See Appendix M for more details on the testing. SEA's analysis showed vibration at a level similar to existing vibration within Charlton North. SEA did modeling to predict the vibration that would

[25] The DM&E trains that were measured included a 67-car loaded unit grain train with 3 locomotives and a 115-car mixed-freight train, partially loaded, with 3 locomotives.

be generated by DM&E's unit coal trains.[26] SEA determined that vibration currently produced by passing trains is just below that allowed for the open-sided MRI. While greater train weight, length, and speed could increase vibration levels, SEA believes that installation of continuously welded rail, as DM&E has proposed, would likely counter much of this increase, resulting in only a small increase, if any, in vibration (See Appendix M). Therefore, any measures taken to isolate the open-sided MRI from internal vibration sources should also be sufficient to prevent impacts from train-produced vibration.

In reviewing the vibration report prepared for Mayo that had indicated a significant peak in vibration during a passing train event, SEA's acoustical expert determined that the nature of this vibration was not consistent with the type of vibration expected from a passing freight train. He determined that the spectral spike in vibration was the result of mechanical equipment, most likely within the Charlton North Building, that began to operate during the train passing, purely by coincidence.

In addition to its vibration testing at Mayo, SEA contacted the manufacturer of the open-sided MRI that Mayo is considering. Its representatives indicated that a rail line approximately 800 feet away should not affect the equipment. As part of an installation, the manufacturer said it would do testing and make recommendations on vibration isolation measures to ensure the MRI's proper functioning. The manufacturer also stated that it has a fully operational open-sided MRI in a facility near a rail line at the Grand Oaks Health Center, in Libertyville, Illinois. SEA spoke with personnel there, and with a service engineer from GE medical equipment, who uses the site as a showplace for demonstrating the Openspeed 0.7T MRI, which has been in operation there for more than year. While this facility is about 1,100 feet from an operating rail line, the MRI is isolated from vibration impacts per the manufacturer's recommendations and operating properly, according to personnel at Grand Oaks Health Center.

Based on its additional analysis, SEA does not anticipate that rail operations, either existing or as proposed by DM&E for this project, would have an impact on sensitive activities at Mayo. All of these activities currently occur in buildings several hundred feet farther from the rail line than the Charlton North Building. The measures, such as pile-supported foundations, currently used to prevent vibration from interior sources should be sufficient to prevent adverse vibration from existing and proposed rail operations in Rochester.

[26] As explained in the Draft EIS, Chapter 3, vibration magnitude does not change when additional trains are added.

As discussed in this chapter under business and industrial land use, SEA determined that vibration from operating trains would likely have an impact on the PEMSTAR manufacturing facility, located immediately adjacent to the existing rail line. Even if, as SEA concluded in its vibration study, vibration levels would not change significantly during project operation, more frequent vibration could have substantial impacts on PEMSTAR. These would likely be most substantial at rail traffic levels substantially greater than today's – above the 50-million-ton level, for example. Below that level, while train traffic could increase from 3 to 21 trains per day, many trains would pass the facility after work hours (between 6 pm and 7 am), and only vibration-sensitive activities that cannot be isolated from adverse vibration using measures currently employed by PEMSTAR would be affected.

SEA also did vibration tests in a residential area of Rochester to evaluate the potential for rail-induced vibration to damage structures near the rail line. These tests indicate that structures as close as 50 feet from the track would not be damaged by ground vibration. The studies also indicate that, following rehabilitation and operation of the existing line, vibration levels should not increase enough to damage residential structures.[27] Since SEA has not been offered evidence that structures along the existing line have experienced damage from past or current rail operations, it concludes, following its additional investigation, that the proposed project is not expected to result in any structural damage to buildings along the existing rail line.

However, SEA does acknowledge that structures, particularly residences along the rail line, would experience increased disturbance from potentially longer and more frequent trains in the vicinity. Tests SEA conducted in the City of Rochester at Seventh Avenue, NW indicated that ground vibration levels at distances 100 feet or more from the track would have only minimal increased vibration, and residences should not experience structural damage. It is possible, however, that residences built on soft, deep soils may experience ground vibration higher than that measured at Seventh Avenue, NW.

Alternative R-4: Bypass for All Rail Traffic

SEA discussed the potential impacts of construction and operation of Alternative R-4, including vibration, in Chapter 3 of the Draft EIS, and did not receive substantive comments related to that vibration information. Therefore, SEA has conducted no additional analysis of the potential impacts of vibration along Alternative R-4. However, based on the additional analysis in Rochester indicating that vibration from rail line operations would not likely result in damage to structures along it, SEA finds that Alternative R-4 would also be unlikely to result in damage to

[27] See Appendix M for further details of SEA's study.

structures along the new rail alignment. It is possible, however, that the five structures within 400 feet of Alternative R-4 could experience vibration from passing trains sufficient to cause disruption and disturbance.

9.3.9 BIOLOGICAL RESOURCES

This section discusses the potential impacts of the Rochester alternatives to biological resources, including vegetation, wildlife, and Federally listed threatened and endangered species.

9.3.9.1 Vegetation

In studying the Rochester alternatives, SEA used the same methods for determining impacts to vegetation as it had used for the entire proposed project route, as in past cases. Nevertheless, SEA's methodology and the lack of specific detail concerning vegetation along the Rochester alternatives were questioned in the Draft EIS comments. As indicated in Chapter 3 of the Draft EIS, the types of vegetation growing along the Rochester alternative routes were determined using aerial photography, site visits, and other sources of information. The method of analysis of impacts to vegetation involved evaluating vegetation within the right-of-way and adjacent to it. SEA determined that significant impacts would occur if lost vegetation consisted of native prairie or forest, was highly valuable to wildlife, or was more abundant in the rail line right-of-way than in the surrounding area. SEA's approach is consistent with what SEA has done in prior proceedings and SEA does not believe the commenters have shown that a different approach is warranted in this case.

Alternative R-2: Reconstruction of Existing Rail Line

As discussed in Chapter 3 of the Draft EIS, Alternative R-2 runs through approximately 4.7 miles of pasture, 20.8 miles of woodlands, and 4.9 miles of cropland. Potential impacts of reconstruction of DM&E's existing line would include damage and destruction of vegetation within the right-of-way and adjacent areas from construction activities, and the possible introduction of noxious weeds during revegetation. However, because reconstruction would require only limited rail bed reconstruction, impacts to vegetation within the right-of-way would be minimal.

Potential operational impacts include right-of-way vegetation loss during maintenance, the use of herbicides and trimming to control vegetation in the right-of-way, and damage in the unlikely event of a major derailment.

In this Final EIS, SEA is recommending mitigation designed to reduce impacts on vegetation. For example, to minimize damage to vegetation within the right-of-way, construction vehicles should be restricted to areas of reconstruction. To prevent damage to vegetation on adjacent lands, herbicides used to maintain the right-of-way should only be applied by a licensed applicator in accordance with all applicable federal, state, and local laws. Trimming of trees and brush within the right-of-way would be required to maintain a clear rail bed and an unobstructed view. Revegetation of disturbed areas should be accomplished as soon as practicable following completion of reconstruction activities.

Alternative R-4: Bypass for All Rail Traffic

Alternative R-4 would cross about 30.0 miles of agricultural land and 2.5 miles of woodland, and construction would permanently convert about 727.3 acres of agriculture land, and 62.0 acres of woodlands to right-of-way. While agricultural land is abundant in southern Minnesota and Olmsted County, mature woodlands are less common, and loss of so much acreage in this area constitutes a substantial impact. Vegetation adjacent to the proposed rail line could be damaged by heavy equipment during construction, and exposure of soils during construction could allow noxious weeds such as Canada thistle to become established.

Operational impacts could include damage to plant species that are not being targeted by herbicide spraying and trimming used to control weedy plants in the right-of-way. Revegetation of the disturbed right-of-way could also give noxious weeds an opportunity to become established. Similar mitigation to that which SEA is recommending for Alternative R-2; however, could be used to prevent vegetation impacts that would result from Alternative R-4.

9.3.9.2 Wildlife

Comments from various agencies disputed SEA's Draft EIS wildlife analysis, claiming inadequate descriptions of migratory bird species in both project areas and inadequate description of impacts to Minnesota State listed species. Federal agencies are required to consider Federal statutes, and since state listed species are not covered by Federal statutes, SEA is not required to consider them as part of an EIS. The Draft EIS discusses potential impacts to a variety of migratory bird species, among them waterfowl, shorebirds, songbirds, raptors, and upland birds, including mourning doves. Because SEA believes it adequately evaluated the potential impacts to wildlife in the Draft EIS, the following summarizes the impacts to wildlife presented there.

Alternative R-2: Reconstruction of Existing Rail Line

As discussed in Chapter 3 of the Draft EIS, reconstruction of the existing rail line through Rochester would disturb wildlife species inhabiting the right-of-way. The Alternative R-2 right-of-way provides suitable, although limited, habitat for a variety of small animals. Small mammals such as field mice and other rodents would be attracted to spilled grain in the rail ballast and would nest in thick growths of grasses and shrubs in the right-of-way, as would cottontail rabbits and various songbirds. The presence of small mammals as a food source would likely attract several species of snakes to the right-of-way. Drainage ditches provide limited habitat for frogs, toads, and other wetland species. There is suitable habitat for ground nesting birds within the right-of-way, and woody vegetation provides nesting areas for songbirds.

Some vegetation within the right-of-way would be lost during reconstruction of the existing line, so that wildlife species that depend on it for habitat would likely be forced out during construction. However, they could be expected to find suitable habitat in undisturbed sections of right-of-way, or adjacent areas. Likewise, emergent wetlands within the right-of-way that provide habitat for songbirds, waterfowl, and amphibians would likely be damaged or lost during reconstruction. Certain slower species, such as reptiles and amphibians, may be killed or injured during reconstruction activities; others would seek out suitable habitat elsewhere. Such impacts should be minimal, because there is limited habitat along Alternative R-2, and the adjacent land is mostly developed.

During the operation of Alternative R-2, vegetation in disturbed right-of-way areas would be reestablished, and some previously displaced individuals and species would likely return. However, the rail line upgrade and DM&E's potential establishment as a Class I railroad would probably result in a better maintained right-of-way than currently exists. Therefore, wildlife species that continue to inhabit the right-of-way's edge would experience an increase in noise and overall disturbance during the operation of this alternative.

Alternative R-4: Bypass for All Rail Traffic

Construction of Alternative R-4 would require permanent conversion of 727.3 acres of cropland, and approximately 62.0 acres of woodland to right-of-way. In addition, about 60.1 acres of wetlands would be lost during its construction. A variety of wildlife species, including large and small mammals, birds, furbearers, reptiles, and amphibians, are likely to inhabit these areas. Wildlife that currently depend on these areas for habitat would be forced out, while slower or less mobile species could be lost during construction.

During the operation of Alternative R-4, wildlife that remain in, or repopulate, the project area could need to cross a rail line where none previously existed. Undeveloped areas adjacent to Alternative R-4 increase the potential that wildlife would use the right-of-way, particularly after its vegetation is reestablished. Wildlife that would use the right-of-way for shelter, foraging, as a movement corridor, or for hunting could be killed in collisions with trains.

9.3.9.3 Aquatic Resources and Fisheries

Aquatic resources and fisheries include organisms that inhabit the streams, ponds, and waterways of the project area. The following section describes potential impacts to these resources from the construction and operation of the Rochester alternatives.

Alternative R-2: Reconstruction of Existing Rail Line

As discussed in Chapter 3 of the Draft EIS, Alternative R-2 crosses seven perennial and eight intermittent streams at existing crossings that may need reconstruction or replacement. Some impacts to fish, mussels, and aquatic invertebrates are likely during the reconstruction of the existing line. Increased construction-runoff sediment and sediment disturbance during in-stream installation of culverts and reconstructed bridges would temporarily affect aquatic life, as explained in Chapter 3 of the Draft EIS, with impacts similar to current maintenance work on the line.

Operational impacts would be similar to those presented in Chapter 3 of the Draft EIS, including exposure of organisms to toxic substances during right-of-way maintenance or an accidental spill. These impacts are unlikely, however, given the line's improved condition and the limited amount of hazardous materials DM&E will transport over this section of the line.

SEA has recommended mitigation in Chapter 12 to address potential impacts to aquatic resources and fisheries. These measures would require best management practices to minimize erosion from the disturbed right-of-way during construction. Also, exposed soil should be mulched and replanted as soon as practicable. Heavy construction equipment should be prevented from crossing streams except at established crossing points, and in-stream work should be limited to what is necessary to rehabilitate crossing structures.

Alternative R-4: Bypass for All Rail Traffic

As discussed in Chapter 3 of the Draft EIS, Alternative R-4 would cross 10 perennial and 28 intermittent steams at new crossings requiring construction of bridges or culverts. Aquatic organisms would experience impacts during construction similar to those described above for

Alternative R-2. However, because of the additional earthwork needed to construct Alternative R-4, and with more stream crossings (all new) required, the potential impact to aquatic organisms from increased sediment and stream disturbance would be greater and would occur for longer than for Alternative R-2.

Operational impacts from Alternative R-4 upon aquatic resources would be similar to those discussed above for Alternative R-2.

9.3.9.4 Threatened and Endangered Species

In Chapter 3 of the Draft EIS there is a complete list of threatened and endangered species in Minnesota that are potentially affected. No Federally listed threatened and endangered species are anticipated in the project area of the Rochester alternatives. Thus, neither Rochester alternative would have any affect on Federally threatened or endangered species.

9.3.10 TRANSPORTATION

Chapter 3 of the Draft EIS, analyzed potential transportation impacts of the Rochester alternatives by estimating maximum vehicle delay and queue length for grade crossings on the alternative routes at three levels of operation – 20, 50, and 100 million tons annually for trains of 115 and 135 cars[28] – to determine their impact on local traffic flow. SEA calculated potential changes in vehicle delay at those crossings where average daily traffic (ADT) volumes are 5,000 or more vehicles (Draft EIS Appendix G). SEA concluded that very few drivers would experience the effects of increased train traffic for highways with ADT volumes below 5,000, and additional delays would be minimal. SEA categorized crossing delays based on levels of service, ranging from free-flowing to severely congested, see Table 9-5 below.

Table 9-5
Grade Crossing Level of Service

Level of Service	Average Total Delay (sec/vehicle)
A	≤5 (free flowing)
B	>5 and ≤10
C	>10 and ≤20

[28] SEA examined these 2 different lengths of trains because in its Application DM&E stated that it intended to operate 115-car trains, but would operate longer trains if that became standard in the railroad industry.

Table 9-5 Grade Crossing Level of Service	
Level of Service	**Average Total Delay (sec/vehicle)**
D	>20 and ≤30
E	>30 and ≤45
F	>45 (severely congested)

Based on these service levels, SEA determined in the Draft EIS the potential significance of increased traffic delays at grade crossings by comparing the existing average total delay (in seconds per vehicle) to the average total delay for each proposed operating scenario. An impact was considered significant if the increased delay per vehicle would result in a post-construction level of E or F, regardless of the pre-construction condition, or if there would be a reduction from a pre-construction level of C or better to a post-construction level of D or worse.

SEA determined that vehicle delay and queue length would be reduced at all seven public crossings along Alternative R-2 in the City of Rochester – East Circle Drive (County Road 22), 11th Avenue NE, 2nd Avenue NE, Broadway, 4th Avenue NW, 11th Avenue NW, and 7th Avenue NW– with ADTs of 5,000 or more vehicles/day. This reduction would result from increasing train speeds along Alternative R-2 from less than 20 mph to between 45 and 49 mph following reconstruction of the existing line. In the Draft EIS, SEA identified no adverse or significant impacts to transportation from Alternative R-2 operation, and noted that existing Alternative R-2 rail shippers would benefit from improved rail service on the rehabilitated line. SEA also evaluated the potential impacts of new grade crossings along Alternative R-4. But, as none of the proposed crossings would have ADTs of 5,000 or more vehicles per day, SEA determined that Alternative R-4 would have only minimal impact on vehicular delay.

In addition to regular vehicle delays, SEA evaluated the potential impacts on emergency vehicle delay in Chapter 3 of the Draft EIS. SEA determined that an important component of emergency vehicle response is travel time to the site of the emergency. As SEA explained, the less time emergency services need to reach the victim, the more likely the incident would be favorably resolved or have a less serious outcome. In other words, delays in arriving at the emergency site have more impact on the outcome than delays in returning from it or arriving at the hospital. SEA also concluded that patients or victims farther from emergency services are more vulnerable to emergency vehicle delays.

The Draft EIS concluded that the increase in train-passing events associated with the proposed project would result in more blockage of grade crossings, increasing the probability that emergency vehicles could be blocked by a train. However, the time each train blocked a crossing would be reduced by the increased train speeds associated with the proposed project. SEA determined that, based on the information available when the Draft EIS was prepared, the impact of this project on emergency vehicle response time was difficult to determine. However, because longer response time can be potentially life-threatening, SEA concluded that operation of the proposed project could have a significant impact on emergency vehicle response time and made preliminary recommendations on mitigation to minimize delay from blocked crossings.

Comments by City of Rochester and Olmsted County

The City of Rochester and Olmsted County both addressed SEA's analysis in their comments, raising concerns about:

- Inaccurate data,
- Inappropriate criteria or standards of analysis,
- Methodology that did not address the scoping issue, and
- Mitigation of potential project impacts.

See also Appendix B. Since these comments largely are addressed to SEA's methodology, for the most part they apply equally to both Rochester alternatives.

Accuracy of SEA's Data

Contrary to Olmsted County's claims, SEA is satisfied that its data is reliable, and that it used an appropriate methodology. In its analysis, SEA primarily relied on information from the FRA grade crossing database for its transportation and safety analysis in the Draft EIS. SEA supplemented this data with updated traffic counts and other details about specific grade crossings, including information on physical characteristics supplied to SEA by Minnesota DOT. SEA obtained train operation data (speed, train length, number of cars) from DM&E.

The object of both SEA's transportation and safety analysis is to compare existing conditions to predicted conditions. Since there is no existing highway/rail-crossing condition on many roadways along the proposed new line (Alternative R-4), SEA could not compare an existing to a future condition, and only the likely future condition could be analyzed. When available from DM&E, the railroad's proposed crossing protection became part of the analysis. Otherwise, SEA conservatively used the lowest level of protection in its calculations. When information on pavement condition was not provided, SEA assumed the crossing to be paved. It

should be noted that roadway surface is a secondary factor of the analysis, and would influence the outcome only if passive warning devices are present and the roadway is unpaved. Therefore, the assumption that unspecified roadways were paved had minimal influence on the outcome of the analysis.

Criteria or Standards of Analysis

Olmsted County is concerned that SEA used inappropriate standards and criteria in its transportation impacts analysis. Specifically, Olmsted County contends that SEA should have applied an 80th percentile accident rate to account for accident trends that may differ among states. But SEA's approach is consistent with the approach used in prior cases and accounts for variations among states in the number of crossings, type of crossing protection, and driver behavior. SEA is aware of no precedent or known research conducted that supports Olmsted County's contention that an 80th percentile accident rate applied nationally would account for accident trends inherent to each state.

SEA agrees with Olmsted County that operation of two-way stopped-control intersections (TWSC) does not necessarily correlate with the traffic flow through a signalized rail grade crossing. However, SEA reasonably used this correlation because this type of intersection is currently not addressed in the Department of Transportation's Highway Capacity Manual. Moreover, there is a predominance of passive warning devices along the existing DM&E system, which do generally function with characteristics similar to a TWSC.

Other Methodology Concerns

Olmsted County also stated in its comments that daily delay to motorists would cost $1.1 million dollars annually and the increased costs of accidents at grade crossing would be an additional $1.0 million annually. In evaluating these comments, SEA assessed the roadway intersections in close proximity to the existing rail line. SEA determined that most of these intersections are equipped with three-phase traffic signals (red/yellow/green). Considering a reasonable cycle time of 60 seconds for each such signal, traffic would be stopped for approximately 30 seconds per cycle, or 30 minutes of delay per hour, and six hours of delay over a 12-hour period such as 7:00 am to 7:00 pm. By contrast, delays from 37-unit coal trains would be less than 1.5 hours per 24 hour day at the maximum level of operations (100 million tons of coal annually) contemplated for this project. Thus, overall, delay from trains would be insignificant compared to delay caused by traffic signals. Furthermore, from a statistical point of view, accidents at grade crossings are relatively rare and infrequent, while traffic accidents at intersections are much more likely and therefore would result in higher overall costs.

Regarding consideration of future traffic levels, it is not common traffic-engineering practice to install traffic signals or highway/rail grade crossing active warning devices based on future traffic projections, as Olmsted County suggested. See *The Manual on Uniform Traffic Control Device (MUTCD) - USDOT.* The transportation and safety analysis applied in this EIS is consistent with the approach that active warning devices are added to the roadway facility when the traffic volumes actually reach the warranted level.

Several commenters were concerned that more trains operating along the existing rail line would adversely affect emergency-vehicle response times, perhaps resulting in loss of life. Some noted that SEA cited references over 20 years old in the Draft EIS, which should be updated. In response, SEA conducted further review of the emergency-response issue using the following references:

Bonnin, M. J., Pepe, P. E., and Clark, P. S. 1993. Survival in the elderly after out-of-hospital cardiac arrest. *Critical Care Medicine*, November, 1993.

Brison, R. J., Davidson, J. R., Dreyer, J. F., et. al. 1992. Cardiac arrest in Ontario: Circumstances, community response, role of prehospital defibrillation and predictors of survival. *Canadian Medical Association Journal*, 147(2), 1992.

Campbell, J. P., Gratton, M. C., Salomone, J. A., and Watson, W. A. 1993. Ambulance Arrival to Patient Contact: The Hidden Component of Prehospital Response Time Intervals. *Annals of Emergency Medicine*, 22:8, August, 1993.

Feero, S., Hedges, J. R., Simmons, E., and Irwin, L. "Does Out-of-Hospital EMS Time Affect Trauma Survival?" *American Journal of Emergency Medicine*, Vol. 13, No. 2, March 1995.

Hotvedt, R., Kristiansen, I. S., Forde, O. H., Thoner, J., Almdahl, S. M., Bjorsvik, G, Berge, L., Magnus, A. C., Mamen, K., Sparr, T., and Ytre-Arne, K. "Which Groups of Patients Benefit from Helicopter Evacuation?" *The Lancet*, Vol. 347, May 18, 1996.

Grossman, D. C., Kim, A., Macdonald, S. C., Klein, P., Copass, M. K., and Maier, R.V. "Urban-Rural Differences in Prehospital Care of Major Trauma," *The Journal of Trauma: Injury, Infection, and Critical Care*, Vol. 42, No. 4, 1997.

Grubb, N. R., Elton, R. A., and Fox, K. A. A. 1995. In-hospital mortality after out-of-hospital cardiac arrest. *The Lancet*, Vol. 346, August 12, 1995.

Karch, S. B., Graff, J., Young, S., HO, Chih-Hsiang. Response Times and Outcomes for Cardiac Arrests in Las Vegas Casinos. *American Journal of Emergency Medicine*, Vol. 16, No. 3, May 1998.

Lombardi, G., Gallagher, E. J., and Gennis, P. 1994. Outcome of Out-of-Hospital Cardiac Arrest in New York City - The Pre-Hospital Arrest Survival Evaluation (PHASE) Study. *Journal of American Medical Association*, Vol. 271, No. 9, March 2, 1994.

Mayer, J. D. "Emergency Medical Service–Delays, Response Time and Survival," *Medical Care*, Vol. XVII, No. 8, August, 1979.

Nichol, G, Detsky, A. S., Stiell, I. G., O'Rourke, K., Wells, G. A, and Laupacis, A. 1996. Effectiveness of Emergency Medical Services for Victims of Out-of-Hospital Cardiac Arrest: A Metaanalysis. *Annals of Emergency Medicine*, 27:6, June, 1996.

Nichol, G, Stiell, I. G., Laupacis, A., Pham, B., De Maio, V. J., and Wells, G. A. 1999. A Cumulative Meta-Analysis of the Effectiveness of Defibrillator-Capable Emergency Medical Services for Victims of Out-of-Hospital Cardiac Arrest. *Annals of Emergency Medicine*, 34:4, October, 1999.

Olson, D. W., LaRochelle, J., Fark, D., et. al. 1989. EMT-Defibrillation: The Wisconsin Experience. *Annals of Emergency Medicine*, 18:8, August, 1989

Pepe, P. E., Wyatt, C. H., Bickell, W. H., Bailey, M. L., and Mattox, K .L. "The Relationship Between Total Prehospital Time and Outcome in Hypotensive Victims of Penetrating Injuries," *Annals of Emergency Medicine*, 16:3, March 1987.

Ramenofsky, M. L., Luterman, A., Curreri, P. W., and Talley, M. A. "EMS for Pediatrics: Optimum Treatment or Unnecessary Delay?" *Journal of Pediatric Surgery*, Vol. 18, No. 4, August 1983.

Sweeney, T. A., Runge, J. W., Gibbs, M. A., Raymond, J. M., Schafermeyer, R. W., Norton, J. H., and Boyle-Whitesel, M. J. 1998. EMT Defibrillation Does Not Increase Survival From Sudden Cardiac Death in a Two-Tiered Urban-Suburban EMS System. *Annals of Emergency Medicine*, 31:2, February, 1998.

Sytkowski, P.A., D'Agostino, R.B., Belanger, A.J., Bettencourt, K.S., and Stokes, J. 1984. Testing a Model That Evaluates Options for Rural Emergency Medical Service Development. *Medical Care*, Vol. 22, No. 3, March 1984.

Weaver, D. W., Cobb, L. A., Hallstrom, A. P., Fahrenbruch, C., Copass, M. K., and Ray, R. 1986. Factors Influencing Survival After Out-of-Hospital Cardiac Arrest. *Journal of the American College of Cardiology*, Vol. 7, No. 4, April 1986.

White, R. D., Asplin, B. R., Bugliosi, T. F., and Hankins, D. G. 1996. High Discharge Survival Rate After Out-of-Hospital Ventricular Fibrillation with Rapid Defibrillation by Police and Paramedics. *Annals of Emergency Medicine*, 28:5, November, 1996.

In reviewing these publications, SEA has confirmed that reduced response time to critically injured patients often determines their survival, but exactly what response time is necessary varies according to type of medical emergency. In cases of cardiac ventricular fibrillation, the most important factor in patient survival seems to be prompt defibrillation. This can be done by emergency response professionals such as paramedics or EMTs trained in basic or advanced life support, or by police, health care professionals, or private citizens trained to use automated external defibrillators (AED). Since studies indicate that quicker defibrillation increases chances of survival, delays in arrival at the scene are most significant, and delays in transporting to the hospital are less critical. While SEA noted some variation in study results, in general, time to defibrillation should be six minutes or less, but seldom can emergency-response vehicles (paramedics or ambulances) respond within six minutes. Police or fire units are generally on the scene up to several minutes sooner than paramedic or ambulance units.

In other medical emergencies, such as cardiac ventricular tachycardia or asystole, quick emergency response makes little difference in patient outcome; such heart conditions are generally fatal. For major trauma, such as extensive internal injuries, the total time from onset of injury to arrival at a trauma center can be significant. The more recent studies cited above support those cited in the Draft EIS, indicating that treatment within the first 30 minutes after injury and arrival at a hospital within the "Golden Hour" are important determinants of patient survival. Many of these studies, however, indicate that a patient's chances of survival may be as dependent on the patient's health, physical condition, medical history, age, and delays in calling for emergency assistance as on emergency-response times.

Based on the evidence, then, there is no way to determine objectively the potential impact of a passing train on emergency response. While it is clear that an emergency vehicle responding to a call but blocked by a train would be delayed, the impact of this delay would be different in every case. As discussed in the Draft EIS, patient outcome would depend on the type of injury involved and whether the delay affected the desired response time for that emergency–six minutes or less for ventricular fibrillation, within an hour for major trauma.

Comments from Mayo particularly concerned how delayed emergency vehicles would affect patients with ventricular fibrillation. While commenters noted that minutes, even seconds, can determine survival or death, they also said that Rochester is training police officers to use AED and equipping patrol cars with these devices. White (1996), cited above, describes a Rochester study of whether police use of AEDs improved patient survival. In this study, survival rates of over 40 percent were found due to police use of AEDs in Rochester.

Based on SEA's additional investigation, it appears that Rochester has already implemented a model program for responding to the most time-sensitive medical emergencies. Placement of AEDs in patrol cars and training officers in their use has enabled Rochester to reduce the time to defibrillation and increase patient survival. During consultation with the Rochester police department, SEA determined that patrol cars are located throughout the city at any given time, with some on the north side of the existing DM&E rail line, and some on the south. This allows prompt police response to an emergency on either side of the rail line, regardless of whether there is a passing train. SEA notes, however, that not all patrol cars are equipped with AEDs, and while the City always tries to have cars with AEDs on duty, all AED-equipped patrol cars could be off-duty at the same time. Under such a scenario, ventricular fibrillation victims would have to wait until emergency medical personnel arrived to administer defibrillation.

Sufficiency of Mitigation: Emergency-Vehicle Response Times

Olmsted County's comments argued that the mitigation in the Draft EIS was insufficient and suggested measures to minimize potential project impacts. SEA reviewed these suggestions, and expanded its recommended mitigation, as presented in Chapter 12.

In developing final mitigation recommendations, SEA gave careful consideration to the potential impacts of the proposed project under Alternative R-2 on emergency-vehicle response, in light of the unique characteristics of Rochester. Specifically, SEA took into account the unique importance of Mayo, which is one of the premier health care facilities in the world and offers a wide range of health-care services. Mayo facilities are concentrated in a relatively small area of downtown Rochester, approximately two blocks by seven blocks, with the remainder of the community clustered around them. The recent merger of Mayo, St. Mary's Hospital, and Methodist Hospital has brought emergency and trauma capabilities under Mayo's umbrella of services, and maintenance of quality health-care service is critical to the continued success of both Mayo and Rochester.

Emergency services are a vital component of medical care, and rapid emergency-vehicle response capability is important to maintain quality health care at Mayo and in Rochester. Therefore, in view of the unique health care provided in Rochester, SEA believes that if Alternative R-2 is approved and implemented, the Board should require construction of two additional grade-separated crossings in Rochester to minimize potential project-related effects on emergency-vehicle response.[29] For additional information, see Chapter 12.

Alternative R-2: Reconstruction of Existing Rail Line

After issuance of the Draft EIS, from October 17, 2000 to November 17, 2000, Rochester studied train movement through the City, counting an average of three trains per day passing through Rochester. Since SEA had based its traffic analysis for Alternative R-2 on 12 trains per day, Rochester questioned the accuracy of SEA's conclusions on transportation impacts. SEA properly used the 12-train-per-day figure because it represents the trains operating during peak periods of grain transport. SEA believes that closed barge traffic on the Mississippi River and unusual amounts of DM&E grain traffic moving west (without passing through Rochester) for interchange with BNSF for transport to west-coast markets during the fall and winter of 2000 may have contributed to the reduced number of trains Rochester observed.

In response to Rochester's data, SEA did additional analysis for transportation impacts based on three trains per day. The results of SEA's additional traffic-delay analysis for Alternative R-2 are presented below. Revised transportation tables based on SEA's additional analysis are in Appendix L.

20 MNT[30]

Under this operating scenario, the total daily time that each grade crossing would be blocked would increase from approximately 12.3 minutes (assuming three trains per day) to about 23.1 minutes, and this would occur not three times (4.1 minutes each) daily but 11 times (2.1 minutes each) daily. All seven grade crossings evaluated would experience a reduction in delay

[29] Rochester had requested three additional grade separated crossings, but as presented in Chapter 12, SEA believes that only two are warranted.

[30] Million Net Tons

per stopped vehicle due to train speed increases from the current 20 mph,[31] to the proposed 45 mph. Thus, while the increase in rail traffic to the 20-million ton level would result in grade crossings more often blocked, the duration would be shorter each time. Level of service would be A following rehabilitation for both train length scenarios that have been studied (115 and 135 rail cars). Because the crossing would not be blocked as long during each incident, maximum vehicle queue length would be reduced for all seven crossings.

50 MNT

Under this operating scenario, the total daily time that each grade crossing would be blocked would increase from 12.3 minutes to 44.1 minutes, and this would occur, not three times daily, but 21 times daily. However, the delay per stopped vehicle again would decrease due to increased train speeds, and service would be at Level A following rehabilitation for a train length of 115 cars, and Level B for 135 cars. The maximum vehicle queue length would be reduced at all seven crossings due to reduced train passing times.

100 MNT

Under this operating scenario, the total daily time that each grade crossing would be blocked would increase from 12.3 minutes per day to 77.7 minutes, or from three times daily to 37 times daily. The delay per stopped vehicle would decrease, however, due to increased train speeds. Service would be at Level B following rehabilitation for train length of 115 cars, and Level C for 135 cars. Maximum vehicle queue length would be reduced at all seven crossings.

Based on SEA's Criteria of Significance (i.e., the projected change in level of service), no significant impacts to transportation would result to any grade crossing along Alternative R-2. However, as noted above, SEA is recommending that the Board require construction of two additional grade separated crossings in Rochester to prevent potential reductions in the quality of emergency response in view of the unique importance of the health care facilities located in that City.

[31] Maximum current train speed allowed for operation over the Alternative R-2 part of the existing line is 20 mph, a figure taken from the Federal Railroad Administration's grade crossing database. During SEA's additional analysis, actual train speeds through Rochester were estimated at about 10 mph, increasing the existing blocked crossing time to approximately 21.9 minutes per day, or 7.3 minutes per train passing.

Alternative R-4: Bypass for All Rail Traffic

SEA received no specific comments on the analysis of transportation impacts presented in the Draft EIS. Therefore, no additional analysis was conducted. SEA reaffirms the conclusion of the Draft EIS that based on SEA's Criteria of Significance, no significant impacts to transportation would result to any grade crossing along Alternative R-4. With respect to emergency response, the amount of time it takes for emergency vehicles to arrive is already longer in rural areas than in cities. Therefore, any project-related delay would further increase emergency response times, potentially leading to significant health impacts.

9.3.11 SAFETY

For the Draft EIS, SEA evaluated the potential impacts of the proposed Rochester alternatives on accident frequency at highway/rail grade crossings. SEA evaluated the potential impacts at three levels of rail line operations, as discussed in detail in Chapter 3 of the Draft EIS. SEA determined that overall increases in accident frequency would be observed at grade crossings along the Rochester alternatives. However, none of the predicted increases would be considered significant based on SEA's significance criteria, described in detail in Chapter 3 of the Draft EIS.

SEA received several comments related to the safety analysis presented in the Draft EIS. Comments from CARB included additional school bus crossings that were not identified in the Draft EIS. Comments from Olmsted County dispute SEA's conclusions regarding project impacts to emergency vehicle response. In response, SEA conducted additional safety analysis with an emphasis on potential impacts to emergency response vehicles and school buses at grade crossings. Additionally, based on data supplied by Rochester indicating existing train levels of three trains per day, SEA has conducted additional analysis of increases in accident frequency based on existing train operations of three trains per day. The results of SEA's additional analysis are discussed below.

As discussed in Chapter 3 of the Draft EIS, rail reconstruction, new rail construction, and increased rail operation could negatively affect the safety of roadway users at grade crossings. Frustration brought on by reconstruction or construction delays could cause motorists to attempt crossing when conditions would not be safe, putting themselves and others at risk of injury. Delays at grade crossings may result in motorists using alternate routes, increasing traffic on local roads and through neighborhoods. Increased numbers of longer trains traveling at increased speeds along the existing rail line, as well as the introduction of rail traffic along the proposed bypass, could increase safety hazards at grade crossings on both the R-2 and R-4 alternatives. Vehicles that could experience potential impacts at grade crossings include school buses that use these grade crossings while transporting children to and from school and school activities.

School Bus Safety

SEA received numerous comments concerning the safety of children in school buses, both along the existing rail line (Alternative R-2) and the proposed new rail line (Alternative R-4). As noted in the Draft EIS, SEA determined that school buses would cross Alternative R-2 more times per day than Alternative R-4. However, as part of its additional investigation into the potential impacts of the project on school bus safety, SEA first noted that state laws currently are in place to protect children in buses from potential rail related accidents. For example, Minnesota State law requires that all school buses stop at least ten feet back from the nearest rail when crossing a rail line. Furthermore, the Minnesota Department of Public Safety has designed detailed procedures for all drivers of school buses to observe at all railroad crossings.

In addition to Minnesota's existing regulations for the safe transport of children in school buses, SEA is recommending mitigation suggested by Olmsted County designed to minimize potential adverse impacts on school bus safety related to DM&E's proposal. This mitigation condition would require DM&E to consult and coordinate with school districts regarding the placement on railroad property of equipment that permits use of in-vehicle warning devices on school buses. Therefore, SEA does not believe the proposed project would negatively affect the safety of children in school buses. School bus crossings for both Alternative R-2 and R-4 are listed below.

Table 9-6
School Bus Crossings for Rochester Alternatives

Alternative	Street name	Number of crossings per day
R-2	7th Street, NW	11
	11 Street, NW	60
	6th Avenue, NW	19
	4th Avenue, NW	33
	Broadway	4
	Civic Center Drive/2nd Avenue, NE	41
	9th Avenue, NE	15
	11th Avenue, NE	82
	15th Avenue, NE	11
	East Circle Drive	63
	Country Road 9, SE	11
	Country Road 11, SE	7
	TWP 211/ 10th Street at 6th Avenue	1
	County 119/ Chester Avenue, SE	15

Table 9-6
School Bus Crossings for Rochester Alternatives

Alternative	Street name	Number of crossings per day
R-4	CSAH 3	16
	90th Avenue SW	8
	80th Avenue SW	8
	CSAH 15	24
	60th Avenue SW	8
	CSAH 8	24
	State 30	32
	31st Avenue SW	8
	TH 63	80
	2nd Avenue SW	8
	CSAH 20	8
	20th Avenue SE	8
	CSAH 1	16
	CR 123	32

Accidents at Rural vs. Urban Grade Crossings

SEA received a comment on the Draft EIS suggesting that accidents are more common at rural grade crossings and are more likely to result in fatalities than accidents at urban grade crossings. SEA conducted additional investigation using information from the United States Department of Transportation (USDOT), National Highway Traffic Safety Administration (NHTSA). SEA searched the Fatality Analysis Reporting System (FARS)[32] database for fatal accidents involving trains and automobiles at grade crossings in Minnesota. Data between the years of 1994 and 1999 for Minnesota reported 68 fatal accidents at all rail grade crossings in the state, of which 57 occurred at rural grade crossings. Thus, approximately 83 percent of fatal grade crossing accidents during this time period occurred at rural grade crossings. (The FARS database considers an area as urban when it has a population of 5,000 or greater). A 1994 report by the NHTSA[33] indicates that, nationwide, 63 percent of fatal rail crossing accidents occur at rural grade crossings.

[32] The Fatality Analysis Reporting System is a database developed by the National Highway Traffic Safety Administration to support the traffic safety community in identifying traffic safety problems.

[33] Terry Klein, Tina Morgan, Adrienne Weiner, *Rail-Highway Crossing Safety: Fatal Crash and Demographic Descriptors*, 1994.

Alternative R-2 would have 15 grade crossings in rural areas of Olmsted County.[34] Two of these crossings occur in Eyota, and five in Byron, but because Eyota and Byron have populations under 5,000, these grade crossing are considered rural. Alternative R-4 would have 34 grade crossings, all in areas outside of any city limits. Therefore, all 34 grade crossings would be in rural areas.[35]

Accident Frequency Analysis

As noted previously, SEA conducted additional analysis of accident frequency increases at grade crossings in Rochester as a result of comments that SEA overestimated the number of existing trains passing through Rochester. The following presents the results of SEA's additional safety analysis for the Rochester alternatives. SEA's analysis tables for the additional safety analysis are included in Appendix K.

Alternative R-2: Reconstruction of Existing Rail Line

Safety concerns for the construction and operation of Alternative R-2 would be as described in Chapter 3 of the Draft EIS. These include accidents at blocked grade crossings and those accidents resulting from detours through neighborhoods. Alternative R-2 has 27 existing grade crossings, at which construction-related safety impacts would include delays and detours. Delays at grade crossings could cause frustrated motorists to attempt crossings that are not safe, putting the motorist and others at risk. Detours at grade crossings would displace traffic to alternate routes, possibly through neighborhoods. Increased vehicular traffic on alternate routes could increase the risk of accidents on these routes. However, the amount of time required to reconstruct the existing rail line is estimated to be less than that required to construct a new rail line with grade crossings. Reconstruction of existing rail crossings could be accomplished in a few days to as little as a few hours. Therefore, safety risks associated with road closures and detours would be temporary.

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[34] As noted in Table 9-6, there are 14 grade crossings on Alternative R-2 that would be crossed by school buses in Rochester, the majority of which are not in rural areas.

[35] SEA notes that FRA established a grade crossing closure initiative - The Closed Crossing Initiative - in 1991 at the National Conference on Highway-Rail Safety. At this conference, held on July 7-10, 1991 in Philadelphia, FRA Administrator Gilbert E. Carmichael announced that FRA would work to achieve a 25 percent reduction in the number of rail/highway grade crossings nationwide. This reflects a goal of closing 73,210 crossings. As of December, 2000, FRA had achieved approximately 52 percent of its goal, having closed a total of 38,183 crossing, comprised of both public and private crossings. While Alternative R-2 would not change the number of grade crossings along DM&E's existing rail line, Alternative R-4 would add 34 new crossings at a time when FRA is working for total reductions in grade crossings.

Operational impacts associated with Alternative R-2 are related to the predicted potential increase in accident frequency. The predicted increase in accident frequency for each level of operation is presented below. In the Draft EIS, SEA established a two-step evaluation process to determine whether the proposed construction would significantly affect safety at rail line grade crossings. For rail line grade crossings that currently experience a high rate of accidents, any increase in accident frequency is less acceptable. SEA considered grade crossings that would either be within the top 50 highest accident frequencies for the State or have an accident frequency of at least one accident every eight years (0.125 accident frequency rate) for Minnesota and an accident increase of one accident every 100 years as significant. For grade crossings that would not meet or exceed the top 50 highest frequencies, SEA considered an increase of at least one additional accident every 20 years (0.05 accident frequency rate) as significant. Those crossings that would have significant impacts based on SEA's analysis were then subjected to further investigation to determine if upgrades to warning devices may be warranted. The following section reflects corrections to the existing level of protection indicated in the Draft EIS for the grade crossings of 4th Avenue Northwest[36] and 2nd Avenue NE[37]. The analysis in the Draft EIS was based on these crossing having only lights for protection; however, both crossings are currently protected by lights and gates. Finally, the additional analysis uses 3 trains per day as the existing level of rail operations.

20 MNT

SEA's safety analysis shows that for the 27 public grade crossings affected by Alternative R-2, the predicted increases in accident frequency at the 20 MNT level of operation would range from 0.003 to 0.022. This translates into a range of increase from one accident every 333.3 years to one accident every 45.5 years. These increases are below SEA's criteria for significance.

[36] It is widely recognized that numerous accidents at grade crossings occur as a result of motorists ignoring rail crossing warning devices. SEA observed during site visits in May of 2001, numerous vehicles in Rochester at the existing DM&E rail crossing of 4th Avenue Northwest, including a Rochester Transit bus, drive around a rail crossing gate that had been deployed.

[37] In the Draft EIS, SEA determined increases in accident frequencies at Broadway Avenue would be significant at 50 and 100 million tons of annual coal transport. For the Final EIS, SEA upgraded the protection at this crossing to be comparable to other crossings in downtown Rochester and determined the additional protection would prevent significant increases in accidents at this grade crossing.

An overall increase in accident frequency would be observed at crossings under Extension Alternatives B and C, resulting in a system-wide changes in accident frequency on Alternative R-2 of 0.322 and 0.305 respectively. This represents a predicted increase of approximately one accident every 3.0 years along this alternative.

50 MNT

SEA's safety analysis shows the predicted increases in accident frequency at the 50 MNT level of operation under Alternatives B and C ranging from 0.005 to 0.033. This translates into a range of increase from one accident every 200 years to one accident every 30.0 years respectively. SEA found these predicted increases to be below the level of significance.

An overall increase in accident frequency would be observed at crossings under Alternatives B and C, resulting in system-wide changes in accident frequency on Alternative R-2 of 0.52 and 0.50 respectively. This represents a predicted increase of approximately one accident every 2.0 years along this alternative.

100 MNT

SEA's safety analysis shows the predicted increases in accident frequency at the 100 MNT level of operation under Alternatives B and C would range from 0.008 to 0.044. This translates into a range of increase from one accident every 125.0 years to one every 22.7 years. SEA found these predicted increases to be below the level of significance.

An overall increase in accident frequency would be observed at crossings under Alternatives B and C, resulting in system-wide changes in accident frequency on Alternative R-2 of 0.68 and 0.66 respectively. This represents a predicted increase of approximately one accident every 1.5 years along this alternative.

Alternative R-4: Approval of Bypass for All Rail Traffic

Construction of Alternative R-4 would create 34 new public grade crossings. Impacts at these crossings during construction would be similar to those impacts described for Alternative R-2, including delays, detours, and increased traffic on ancillary roadways. The primary difference would be that there are currently no grade crossings on these roadways, and construction of a new grade crossing would very likely take longer than the reconstruction of an existing grade crossing. Likewise, motorists using the existing grade crossings on Alternative R-2 are generally accustomed to the potential for traffic delay and obstruction, whereas those that travel the roadways on Alternative R-4 are not.

Operational impacts associated with Alternative R-4 are related to the predicted potential accident frequency at each crossing. The predicted accident frequencies for each level of operation were presented in Chapter 3 of the Draft EIS. None of the proposed grade crossings along Alternative R-4 was predicted to have an accident frequency above SEA's level of significance. Because no grade crossings currently exist, an increase in accident frequency is not available for these crossings. Therefore, the projected accident frequency at these crossing would represent the potential for vehicle/rail accidents resulting solely from operation of Alternative R-4.

9.3.12 HAZARDOUS MATERIALS

SEA received numerous comments related to health risks associated with the transport of hazardous materials and the potential impact should a derailment occur. Additional explanation of the potential effects from hazardous materials, related to this project is provided below.

Transportation of Hazardous Materials

As discussed in Chapter 3 of the Draft EIS, DM&E currently transports approximately 200-250 cars of hazardous materials per year. These materials include liquified petroleum gas (LPG), anhydrous ammonia, phosphoric acid, ferric chloride, fuel oil, and ethylene acetyl (flammable gas). The majority of these materials are received from other rail carriers or loaded in the Winona, Minnesota area and are transported westward through Rochester.

Alternative R-2: Reconstruction of Existing Rail Line

The Federal Medical Center (FMC) in Rochester is located directly adjacent to the existing DM&E rail line. The FMC's administration expressed concerns about the impact that a derailment resulting in a hazardous chemical spill would have on the FMC. Their position is that because of the condition of the inmates at the facility, in the event of a chemical spill, FMC would be unable to evacuate inmates or staff, putting both at risk. Mayo expressed similar concerns related to evacuation of patients. SEA also received numerous comments from citizens in Rochester concerned about the dangers posed by a derailment of hazardous material occur.

Construction and operation of Alternative R-2 is not anticipated to increase the amount of hazardous materials that DM&E would transport. Therefore, the PRB Expansion Project should not cause adverse impacts. Moreover, should DM&E be granted approval to reconstruct its existing rail line, and expand into the Powder River Basin, it would replace the existing line with new upgraded lines, which would reduce the risk of a spill.

Alternative R-4: Bypass for All Rail Traffic

Because no rail line currently exists in the Alternative R-4 project area, no hazardous materials are currently transported by rail through this area. Construction of Alternative R-4 would introduce the opportunity for hazardous materials to be transported and potentially spilled along the new rail line. Although Alternative R-4 would not increase the amount of hazardous materials transported by DM&E, the hazardous materials that have been transported over the existing rail line through Rochester would now be transported over Alternative R-4.

Hazardous Material Sites

As described in Chapter 3 of the Draft EIS, hazardous material sites are places where releases of hazardous materials have been reported to Federal, state, or local authorities.

Alternative R-2: Reconstruction of Existing Rail Line

In Olmsted County, 6 Leaking Underground Storage Tanks (LUST) sites are listed within 0.5 mile of the existing DM&E rail line. Because specific site information for each identified site is not available, it is not possible to determine the potential impacts reconstruction of the existing rail line would have on these sites. The potential exists for contaminants to be exposed during earth moving activities. The limited amount of earth moving required for reconstruction of the existing rail line would make such an event unlikely. However, should such an event occur, rail line workers, construction workers, and nearby residents, as well as wildlife, vegetation, surface water, and groundwater could be exposed to hazardous materials. In that event, existing laws regarding remediation would apply.

Operation of Alternative R-2 would have no impact on hazardous material sites.

Alternative R-4: Bypass for All Rail Traffic

No hazardous material sites are known to occur along Alternative R-4, and the potential for unknown hazardous material sites along Alternative R-4 is unlikely due to the rural nature of the project area.

9.3.13 ENERGY RESOURCES

The following sections contain further discussion on the project-related impacts to the transportation of energy resources and the utilization of energy resources.

Transportation of Energy Resources

Upgrade of existing DM&E rail line would provide a more cost effective transportation route for PRB coal as discussed in Chapter 3 of the Draft EIS.

Utilization of Energy Resources

Chapter 3 of the Draft EIS describes how DM&E has proposed a shorter and more efficient route for the transport of coal from the PRB to potential markets. Because Alternative R-4 is approximately 10.8 miles longer than Alternative R-2, more fuel would be required to transport coal over Alternative R-4, making this alternative less energy efficient then Alternative R-2. Table 9-7 shows the gallons of additional diesel fuel required for moving coal over Alternative R-4 at the various operational levels evaluated. Although 10.8 miles is not a great distance, as can be seen in Table 9-7, it would require significantly more fuel than Alternative R-2. Additionally, differences in rail line grade and the increased number of large curves (which for a railroad have the same affect as increasing grade) along Alternative R-4 likely would result in even greater fuel usage.

Table 9-7
Fuel consumption in gallons per year for Rochester Alternatives

Alternative	Distance	Gallons of fuel per year		
		11 trains per day	21 trains per day	37 trains per day
Alternative R-2	23.3 miles	1,058,145 gal/year	2,020,095 gal/year	3,559,215 gal/year
Alternative R-4	34.1 miles	1,548,195 gal/year	2,955,183 gal/year	5,206,872 gal/year
Difference in Mileage	10.8 miles	490,050 additional gallons per year	935,088 additional gallons per year	1,647,657 additional gallons per year

Based on 17,045 tons per loaded train, 5,545 tons per empty train, using a factor of 993.8 ton miles per gallon of fuel. Train operates 363 days per year.

9.3.14 CULTURAL RESOURCES

The following discusses the potential known cultural resources that would be found within the right-of-way of the Rochester alternatives and could be adversely affected. There may be other as yet unknown, unidentified, or unevaluated structures and sites of historic and cultural significance along the existing and proposed alternative rights-of-way.

Alternative R-2: Reconstruction of Existing Rail Line

The Draft EIS (Chapter3) stated that 40 cultural resource sites occur within or adjacent to Alternative R-2. Of these sites, 36 are considered eligible for the National Register of Historic Places (NRHP). The list of cultural resources within the existing rail right-of-way includes structures associated with the DM&E railroad, such as stone box culverts, stone arches, and wooden trestles. Reconstruction of the existing rail line would likely result in modification or removal of many of these structures, resulting in adverse impacts to these resources. However, all of these structures could also be subject to modification or removal as part of normal rail line maintenance activities.

During operation of Alternative R-2, impacts to cultural resources would primarily relate to increased rail traffic along the existing rail line. Because the cultural resources along Alternative R-2 were originally developed as part of the rail line, the operation of the rail line would not change the nature or context in which these structures are found. No impacts from operation are expected to occur to these cultural resources.

Any impacts associated with reconstruction and operation of the existing rail line to these known sites or any unknown sites would require mitigation in accordance with the Programmatic Agreement (PA)[38] included as Appendix G in the Final EIS. SEA has recommended that the Board impose a condition requiring compliance with the PA.

Alternative R-4: Bypass for All Rail Traffic

The Draft EIS (Chapter 3) contains descriptions of the three known potential cultural resources within or adjacent to the right-of-way of Alternative R-4, including a historic school house, and two log homes. These structures of potential historical significance were identified during a literature search of the Alternative R-4 project area. One of these sites would be within the proposed right-of-way, and two others would be directly adjacent to the right-of-way. None of these sites have been evaluated against the NRHP criteria, nor have they received official Minnesota site numbers. Additionally, no traditional cultural properties (TCP), prehistoric or historic archaeological sites, or historic structures that have been issued official Minnesota State Historic Preservation Officer (SHPO) site numbers were identified within the project area. Further evaluation of these structures would be required if Alternative R-4 were approved.

[38] The Programmatic Agreement for this project developed by SEA, the Cooperating Agencies, State Historic Preservation Offices, Advisory Council on Historic Preservation, and Tribes to ensure compliance with the National Historic Preservation Act, Section 106.

CARB indicated in its comments numerous other structures potentially of historical significance. SEA reviewed these comments and determined that these structures may be eligible for the NRHP. In addition to historic structures and resources, the potential exists for Alternative R-4 to affect archaeological resources. Further evaluation would be required if Alternative R-4 were approved.

9.3.15 SOCIOECONOMICS

Potential impacts to the socioeconomics of the Rochester alternatives project areas are described below.

Alternative R-2: Reconstruction of Existing Rail Line

Chapter 3 of the Draft EIS addresses various potential positive impacts to the socioeconomic community in the Alternative R-2 project area as a result of this alternative. Additional jobs, increased tax revenues, and new business opportunities would result.

Comments received on the Draft EIS raise concerns that Alternative R-2 would have negative impacts on the socioeconomics in the project area. Concerns raised include potential loss of property values to land near the rail line, loss of revenue for businesses near the rail line, and closure or relocation of businesses near the rail line. Mayo has expressed concerns about the impact that Alternative R-2 would have on the desirability of coming to Rochester instead of hospital facilities in other parts of the country.

SEA has addressed the potential loss of property value in the Residential Land Use section of this chapter. As explained there, residential property values are determined by many factors, and proximity to a rail line is only one factor that may determine the value of a particular piece of property. SEA acknowledges that some loss of property value may occur to those residences nearest the existing rail line, if the PRB Expansion Project is approved and the line through Rochester is reconstructed, but SEA does not believe any reductions would be significant.

Additionally, it is likely that property value reductions would be most likely at higher levels of rail traffic – above 50 million tons of annual coal transport. Below 50 million tons of annual coal transport, there would be less than 21 trains per day, and little if any reductions in property values may occur. Although SEA has evaluated up to 37 trains per day traveling through Rochester as part of this EIS, this many trains may never pass through Rochester due to

numerous places where DM&E trains could be interchanged with other rail carriers west of the City.[39]

In preparing this Final EIS, SEA further evaluated the possibility that Alternative R-2 would have possible impacts on patients coming to the Mayo Clinic. Accessibility to Mayo should not be a concern. Based on comments from Mayo, approximately 50 percent of Mayo's patients come to the facility from outside of Rochester. On a typical day, approximately 1,000 new patients arrive for treatment, of which approximately 150 are admitted as inpatients. As noted previously, the Mayo Clinic and the majority of Rochester's hotel/motel rooms are located on the south side of DM&E's rail line. Out of town patients seeking medical care at the Mayo Clinic would likely not be required to cross the rail line because there are abundant hotel and dining facilities on the south side of the DM&E tracks. Potential patients traveling to the Mayo Clinic from areas north of Rochester that would not require an overnight stay could experience some delay at a rail crossing blocked by a passing train. However, based on SEA's transportation analysis, this delay would not be significant. Therefore, SEA does not believe operation of Alternative R-2 would present significant impacts to Mayo patients. SEA believes that patients will continue to come to Mayo because of its reputation and the high quality of its medical care. No significant reduction in patient visits or Mayo's business is anticipated as a result of this project.

SEA also received comments stating that operation of Alternative R-2 would likely result in the loss of a substantial number of jobs due to the increased rail operations resulting in PEMSTAR relocating all or part of its Rochester facilities. SEA acknowledges that it appears likely that at higher levels of rail traffic, the existing PEMSTAR facility adjacent to DM&E's existing rail line could be substantially impacted. However, as previously noted, PEMSTAR has other facilities in Rochester and it has considered relocating its vibration-sensitive operations to this facility. Additionally, PEMSTAR could find a new location within Rochester or implement additional measures to isolate vibration at its existing facility. Furthermore, even if PEMSTAR were to leave Rochester, its decision to do so could be for business reasons other than the impacts from the proposed R-2 Alternative.

While it does not appear to SEA that PEMSTAR would relocate from Rochester solely due to operation of Alternative R-2, the jobs lost if it relocated could decrease economic activity in Rochester. However, the combination of new DM&E jobs in the area, particularly for the East Staging and Marshalling Yard, Rochester's status as a growing and vibrant community, and the fact that PEMSTAR accounts for only a small percentage of the total jobs in Rochester (about

[39] Until DM&E signs actual coal contracts, the numbers of trains that would interchange with other railroads outside of Rochester cannot be determined.

600 total), would not be expected to have significant economic impacts on Rochester or Olmsted County.

SEA also received comments from the City of Rochester and Olmsted County expressing concerns about reductions in tax revenues as a result of decreased property values. As noted previously, SEA does not believe any declines in property value from this project would be significant. Only a small percentage of the residences in the city Rochester and Olmsted County are located along the existing rail line. Therefore, any reduction in property taxes would not be significant when compared to the total taxes generated in Rochester and the remainder of the county.

Alternative R-4: Bypass for All Rail Traffic

SEA discussed in the Draft EIS that the presence of a rail line in the area of Alternative R-4 would reduce farm revenues by converting agricultural land to rail line right-of-way. In addition, SEA preliminarily determined that the presence of a rail line across undeveloped land could have potential economic benefits due to the area becoming favorable for commercial development. Additionally, SEA noted that during construction and operation of any rail line alternative in Olmsted County, the county would receive economic benefits from spending by construction workers, new permanent railroad jobs created in the area, and increased taxes, both sales and property, being available to the county.

SEA received comments from CARB acknowledging that this may be possible, but pointing out that Alternative R-4 would require the taking of productive agricultural land. CARB also pointed out that commercial or industrial development in this part of the county would be in conflict with Olmsted County's land use plan. SEA concurs with CARB that it is unlikely that new businesses or industries would be attracted to the new rail line and that the primary economic impact of Alternative R-4 would be the conversion of cropland to rail line right-of-way. The amount of cropland lost would be distributed over many farms along the right-of-way. However, in the struggling agricultural economy, even small losses to individual farms could have a significant impact on individual farmers ability to continue to farm.

9.3.16 ENVIRONMENTAL JUSTICE

SEA conducted an extensive analysis to determine the potential for disproportionate adverse impacts to occur to minority or low-income communities, collectively referred to as environmental justice communities, as discussed in detail in Appendix D of the Draft EIS. SEA's criteria for classification of a census block group as environmental justice status in the Draft EIS were:

- at least one-half of the census block group is of minority status
- at least one-half of the census block group is of low-income status
- the percentage of minority status for the census block group is at least 10 percentage points higher than for the entire county in which the census block group is located
- the percentage of low-income status for the census block group is at least 10 percentage points higher than for the entire county in which the census block group is located

Based on these criteria, SEA determined the number of environmental justice communities that would be crossed or affected by the Rochester Alternatives. SEA determined that Alternative R-2 would affect 10 potential environmental justice communities. Alternative R-4, however, would not affect any potential environmental justice communities. SEA determined that one low-income census block group along Alternative R-2 would be disproportionately impacted at all levels of rail operations.

As discussed in detail in Chapter 3, SEA received comments on the environmental justice analysis conducted in the Draft EIS regarding the methodology SEA had employed in its analysis and use of 1990 census data instead of more recent 2000 census data. Based on comments submitted by EPA, SEA used different criteria to identify potential low-income and minority populations. These criteria included:

- considering income levels to be those at and below 1.5 times the poverty level
- use of state percentages for minority and low-income populations rather than the county percentages
- comparison of the census block group percentages for minority and low-income populations to 1.5 times the state percentages for these groups

Appendix N contains a detailed discussion of SEA's revised environmental justice methodology.

In addition, SEA received numerous comments from agencies (including EPA), communities, and citizens questioning why SEA had used 1990 census data in its analysis rather than 2000 census data. The commenters suggested that the 1990 census data was out-of-date and no longer a valid representation of the population characteristics. Additionally, some commenters indicated that various communities along the rail line had more recent census data for the particular communities. As discussed in detail in Chapter 3, SEA required consistent data in order to conduct a valid environmental justice analysis for the entire project. Additionally, data at the census block group level from the 2001 Census would not be available until summer of 2002 or

later. Therefore, SEA utilized data from the 1990 census for its additional environmental justice analysis.

The following sections discuss the potential impacts of the Rochester Alternatives to environmental justice communities based on SEA's additional analysis.

Alternative R-2: Reconstruction of Existing Rail Line

Chapter 3 of the Draft EIS states that Alternative R-2 would cross 10 census blocks determined to meet the criteria for environmental justice communities. Six of these census block groups are so classified because the percentage of persons in the census block group at or below the poverty level is 10 percent more than the percentage for Olmsted County. Four census block groups are classified as environmental justice communities because their minority population is more than 10 percent higher than that percentage of Olmsted County. Two census block groups meet both the income and minority rule environmental justice criteria. SEA's analysis in the Draft EIS determined that one low-income census block would experience a disproportionate impact due to increased noise. This impact would occur at all operating levels (20, 50 and 100 million tons annually).

Using the environmental justice methodology suggested by EPA (discussed in detail in Appendix N), SEA identified only 9 census block groups crossed or that would be affected by Alternative R-2 as meeting the criteria for classification as environmental justice communities. Two of these census block groups are classified as environmental justice communities due to 50 percent of the households in the census block group being low-income. One census block group is classified as environmental justice due to the percentage of low-income households within the census block group being greater than 1.5 times the low-income percentage for the state. Five census blocks met the environmental justice criteria due to the percentage of minorities within the census blocks being higher than 1.5 times the minority percentage for the state. One census block was classified as an environmental justice community due to at least 50 percent of the households being low-income and the minority percentage being higher than 1.5 times the state minority percentage.

SEA evaluated the impacts of the proposed Alternative R-2 to these environmental justice census block groups and compared these impacts to the impacts expected to the non-environmental justice census block groups (Appendix N). SEA's analysis determined that four of the census block groups would experience disproportionate impacts due to increased noise. Disproportionate impacts would occur to two census blocks at the 20, 50 and 100 million ton level of operations, one census block group at the 50 and 100 million ton level, and one census block group at only the 100 million ton level of operations.

In addition, SEA determined one environmental justice census block group would be disproportionately impacted due to the grade crossing at Broadway Street (crossing 193277D, MP 0041.90) predicted to experience an increased accident frequency meeting SEA's criteria for significant impact. This environmental justice census block group was also identified to be disproportionately impacted by increased noise at the 50 MNT and 100 MNT levels of rail operation.

Alternative R-4: Bypass for All Rail Traffic

Alternative R-4 would not cross any census block groups determined by SEA to meet the criteria for environmental justice. Therefore no impacts to such communities would occur communities.

9.3.17 RECREATION

As discussed in the Draft EIS, a wide variety of recreational opportunities are available in Rochester and the surrounding area. The following is a summary of these opportunities that could potentially be impacted by the construction or operation of Alternatives R-2 and R-4.

Alternative R-2: Reconstruction of Existing Rail Line

As discussed in the Draft EIS in Chapter 3 the existing rail line passes adjacent to East Park, Quarry Hills Park, and Cooke Park. Additionally, three multi-use recreational trails, the Zumbro River Trail, the Quarry Hill Trail, and the Cascade Creek Trail are crossed by, or are adjacent to, the existing DM&E rail line. Mayo Field, home of the Northwoods Baseball League Rochester Honkers, is approximately 100 feet from the existing rail line. Potential construction impacts on recreation include increased dust and noise and concerns about citizen safety during periods of construction activities. Additionally, construction activities could create temporary closures or detours on the three multi-use trails. In response to the comments, SEA is recommending fencing mitigation to minimize impacts to recreational facilities. See Chapter 12.

Alternative R-4: Bypass for All Rail Traffic

Recreational opportunities in the Alternative R-4 project area, as presented in Chapter 3 of the Draft EIS, include outdoor sporting activities such as fishing, hunting, and snowmobiling. Potential impacts to these recreational opportunities would include increased dust, noise, and safety concerns during construction and operation, and disturbance of solitude and a decrease in the overall quality of the outdoor experience.

The overall impact to these recreational opportunities would be minimal considering the large amount of land available in the project area for such activities. The R-2 Alternative would have greater impacts on recreational facilities because the area is urban and more developed.

9.3.18 AESTHETICS

SEA received no substantive comments on the potential project impacts to aesthetics that would require additional analysis. Therefore, no additional analysis was conducted and the potential project impacts to aesthetic resources as discussed in the Draft EIS are considered appropriate.

9.4 SEA'S RECOMMENDATIONS

SEA indicated in the Draft EIS that, if appropriate, it would identify a preferred alternative for Rochester in the Final EIS. In determining a preferred alternative, SEA has considered all the information available regarding the environmental effects of the proposed project, including information presented and discussed in the Draft EIS, comments received on the Draft EIS, and the results of the additional analysis conducted in preparation of this Final EIS. For the reasons discussed below, SEA recommends that, if the Board gives final approval to the PRB Expansion Project, Alternative R-2 — reconstruction and operation of DM&E's existing rail line through Rochester — would be the environmentally preferable route.

Karst. As previously indicated, the high probability of karst areas along Alternative R-4 make it likely that there are substantial numbers of hidden subsurface voids that will collapse to form sinkholes in this area and that, therefore, construction and operation of the proposed bypass would entail a significant risk. Although the construction and operation of the bypass is theoretically possible, the mitigation and monitoring that could be necessary would be prohibitively expensive.[40] In addition, the necessary mitigation, which could require construction of a cement dam or wall underneath the rail line, could itself result in potentially significant impacts on groundwater flow, thereby affecting wetlands, springs, streams, rivers, vegetation, and wildlife and their habitat. Such a mitigation strategy would, in any case, not significantly reduce the risk of potential collapse.

[40] Rochester itself estimates (in Exhibit 2 of its comments) that the cost of constructing the 34-mile bypass would be $92 million including $800,000 for karst investigation, $725,000 for noise mitigation, $600,000 for wetlands mitigation, $1,077,000 for fencing, $1,094,000 for establishing vegetation, and $10,500,000 for three grade separated crossings. DM&E estimates that the construction cost of the bypass (including only wetlands mitigation) would be $137.8 million.

Most important, groundwater flow is a key element in sinkhole formation. Therefore, changes in groundwater flow could cause sinkholes to form in a more accelerated fashion and/or in areas along the R-4 route where they may not otherwise have formed. In contrast, although surveys have identified some sinkholes near or within the existing R-2 route, that route has been in operation for over a century without significant sinkhole problems. This indicates that hidden sinkholes likely are not present and that sinkholes pose no threat to the proposed reconstruction of the existing line.

Other Factors. In comparing the R-2 and R-4 alignments for this EIS, SEA has determined that both would have significant environmental impacts, albeit to different resources. Rehabilitation and operation of the existing line, which passes through largely developed, urban areas, would have potentially significant impacts on noise and transportation including emergency-vehicle response, and SEA has developed mitigation to minimize these impacts where possible (See Chapter 12).

Construction and operation of the R-4 bypass, which crosses rural, agricultural land, also would have potentially significant impacts. In particular, natural resources including geology, soils, farmland, and wetlands would be significantly impacted. In addition, the R-4 Alternative would have some of the same potentially significant impacts as the R-2 route. For example, the effects on emergency-vehicle response would be similar or worse under Alternative R-4.

In response to comments received on the Draft EIS, SEA conducted extensive additional analysis in the Rochester area. SEA has determined that certain impacts of the R-2 route, such as vibration, initially determined to be potentially significant in the Draft EIS, would in fact be less severe than originally thought. SEA also has added extensive new mitigation recommendations for Rochester in the Final EIS. SEA's recommended mitigation would include two separated grade crossings in the City, one to be constructed when DM&E carries 20 million tons of coal annually through Rochester, and the other when the 50-million-ton level is reached. SEA is also recommending noise mitigation for Rochester.

SEA acknowledges that even with mitigation, there will be impacts to the City of Rochester if the PRB Expansion Project is constructed and operated. However, some of these potential impacts may never be realized if the traffic through Rochester fails to rise to the full level of 100-million tons of coal annually.

If it were not for the potential sinkhole problems associated with Alternative R-4, it would be difficult for SEA to identify an environmentally preferable route for Rochester given the adverse, but different effects of Alternatives R-2 and R-4. However, because of the potential threat of sinkholes associated with Alternative R-4, SEA cannot recommend that alternative

route. Accordingly, should the Board approve the PRB Expansion Project, Alternative R-2 would be the environmentally preferable route.

Costs. In its December 10, 1998 decision in this case, the Board indicated that in issuing a further decision it would assess not only the potential environmental impacts of the proposed project, but also the cost to mitigate these impacts.

Either Alternative R-2 or R-4 would constitute only a small part of the total PRB Expansion Project. In assessing the proposed cost of the R-4 bypass, SEA has determined that the cost of the geotechnical investigation to identify hidden sinkholes could total several million dollars and that the cost of constructing and mitigating the 34-mile bypass, even assuming that no sinkholes need to be mitigated, would likely be around $150 million, without any cement grouting to create an underground dam or wall or fill existing sinkholes.[41] In contrast, Rochester's own cost estimates for rehabilitating and mitigating the 23.6-mile route through town — assuming that the Board adopted all 14 of its suggested mitigation measures — would be $64,600,000,[42] which, of course, is considerably lower. The R-4 Alternative also would cost more to operate (because of additional fuel costs and track maintenance costs would be greater) than the costs associated with Alternative R-2. Additional information on projected mitigation costs for the PRB Expansion Project are presented in Chapter 12.

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[41] After reviewing the cost figures of DM&E and Rochester, SEA believes that the cost estimates for the R-4 bypass by Rochester and DM&E are understated because the cost of earthwork and karst investigation are too low. See Appendix M.

[42] Rochester comments, Exhibit 2, Table 2.